IST-004527 ARTIST2
Network of Excellence
on Embedded Systems Design

Spreading Excellence

Artist2 Technical Coordinator:
Bruno Bouyssounouse (Verimag)

with inputs from all NoE participants

The visibility of the ARTIST2 research effort in embedded systems design is worldwide. This is progressively creating a European embedded systems design community, and spreading the "artist culture" in all major research institutions.

To ensure that the next generation of researchers will continue in this direction we, as a consortium, devote a great deal of effort to Spreading Excellence, in both academic and industrial circles. Furthermore, through our links with both core and affiliated partners, we are actively setting up permanents links between industry and public research, leveraging on existing partner collaborations with major industrial players in the area.

This document shows that ARTIST2 has a strategic impact on the integration of multiple academic research communities, which are necessary to establish the new area of embedded systems design.

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1. Vision and Strategy for Spreading Excellence - *Executive Summary*

1.1 Overall Vision and Strategy

Our actions for Spreading Excellence are at 2 levels:

- *Targeted towards affiliated partners*
  Affiliated partners are not core members in the consortium, but receive support for travelling to Artist2 meetings, and actively contribute to the implementation of the Joint Programme of Activities (JPA). These affiliated partners include industrial, SME, academic, and international affiliates.
- *Targeted towards the scientific and technical community in the large*
  This is achieved mainly bottom-up through the organisation of scientific events, publications, distribution of tools and components, industrial partnerships (not funded by Artist2), education; and through the Artist2 web pages.

Regarding Scientific events, we distinguish between conferences and workshops, schools, and high-level events mainly for International Collaboration.

High Level Events for International Collaboration
High-level Events are intended to gather together the very best world-leading experts from academia and industry, to discuss progress on the state of the art, relevant work directions.

Three Artist2 members are on the steering board for the ARTEMIS European Technology Platform. In this capacity, they participate in working groups for defining the overall European long term strategy in the area.

Publications
The Artist2 community has been very active in publishing in scientific journals and conferences, as attested by the list of publications provided in this document. Clearly, this represents a huge amount of work. Publication of research is a bottom-up process, which may seem chaotic – but this is intrinsic to research.

Tools and Components
The Artist2 community plays a leading role in the distribution of software tools and components, on verification/validation tools. Some tools are distributed free of charge, such as UPAAL, IF. Others are commercialised, such as AbsInt, SymTA/S. For many other tools used in the platforms, and shared between the Artist partners, a common dissemination policy has not yet been defined.

Industrial Liaison
Artist2 has a wide array of affiliated industrial and SME partners (see the Periodic Activity Report). Most of these partners have participated in some way in the Artist2 technical meetings and the overall effort. There is strong, high-level industry participation through the various Spreading Excellence events organised by Artist2. Our active involvement in the European Technology Platform ARTEMIS also could have a significant and long-term impact.

We believe that the strong involvement of four main Artist2 partners in the SPEEDS Integrated Project has a very positive impact on progress in the state of the art, in component-based embedded systems engineering.

1.2 Affiliated partners

Affiliated partners are not core members in the consortium, but receive support for travelling to Artist2 meetings, and actively contribute to the implementation of the Joint Programme of Activities (JPA). These affiliated partners include industrial, SME, academic, and international affiliates.

At the end of Year 3, the NoE has 23 large industrial affiliated partners, 10 SMEs, 37 academic, and 17 international affiliated partners. All of these partners have participated in one or more of our technical events and work over the course of the Years 1-3. We have also had a very large number of participants from the wider research and industrial communities, who are not listed officially.

As planned, the Artist2 consortium will continue to increase its affiliated partners. The procedure for joining Artist2 as affiliated partners is described here:
http://www.artist-embedded.org/artist/Becoming-an-Affiliated-Partner.html

1.3 Scientific and Technical Community in the Large

This is achieved mainly bottom-up through the organisation of scientific events, publications, distribution of tools and components, industrial partnerships (not funded by Artist2), education; and through the Artist2 web pages.

Our sponsoring policy aims specifically at enforcing integration of existing scientific events in the area. This is sought in particular through the Embedded Systems Week (http://www.esweek.org/), in which we play a crucial role.

Another concrete example is our action within the DATE conference (http://www.date-conference.com/), in which we are working to shift the emphasis towards becoming the central European conference on embedded systems design, in collaboration with the ARTEMIS European Technology Platform.

Regarding Scientific events, we distinguish between conferences and workshops, schools, and high-level events mainly for International Collaboration.

The ARTIST2 community effectively plays an important role and leads the initiatives for organizing the most significant conferences in the area. In Europe, it has a very strong presence in the DATE conference, which is becoming the main conference on embedded systems within Europe. Over the past 6 years, the chairs of DATE have all been leading Artist members. Also for the past 6 years, we have organized 1-day Artist workshops within the DATE framework, on cutting-edge topics and including presentations from both Artist participants, and other world-class speakers.

In international conferences, the ACM's flagship conference, EmSoft, has been initiated by leading members of Artist2. These researchers now chair the steering and executive committees. Artist partners are also in leading positions for conferences as RTSS (Real-Time Systems Symposium), CODES/ISS, Workshop on Languages, Compilers, and Tools for Embedded Systems (LCTES). Further details regarding sponsoring, as well as specific events and publications are given in this document.

Artist partners are also active members of the ACM's SIGBED, and the IEEE's upcoming Special Interest Group on Embedded Systems currently being set up. Artist members actively work for structuring international events on embedded systems.

This year the 3rd edition of the Embedded Systems Week, including EmSoft and CODES/ISS will takes place in Sept 30th – Oct 5th 2007, in Salzburg (Austria).

1.3.1 International Collaboration

In Year 3, we have organised the second Artist-China school on embedded systems. The school gathered more than 112 participants, more than a 100% increase with the first edition the previous year. Given the continuing success of this series, it has been decided to organise a third ARTIST2 school in Beijing in 2008.

Furthermore, we are planning to organize a second Artist2 – South American school in Buenos Aires, in 2008.

1.3.2 Publications

The Artist2 community has been very active in publishing in scientific journals and conferences, as attested by the list of publications provided in this document. Clearly, this represents a huge amount of work.

1.3.3 Tools and Components

The Artist2 community plays a leading role in the distribution of software tools and components, on verification/validation tools. Some tools are distributed free of charge, such as UPAAL, IF. Others are commercialised, such as AbsInt, SymTA/S. For many other tools used in the platforms, and shared between the Artist partners, a common dissemination policy has not yet been defined.

1.3.4 Industrial Liaison

Artist2 has a wide array of affiliated industrial and SME partners, as described in this document (section: “Affiliated Partners in the ARTIST2 Research Activities”). Most of these partners have participated in some way in the Artist2 technical meetings and the overall effort. There is strong, high-level industry participation through the various Spreading Excellence events organised by Artist2.

Our active involvement in the European Technology Platform ARTEMIS also could have a significant and long-term impact. Several Artist2 partners, including OFFIS, PARADES, VERIMAG; and TU Vienna, are actively involved in the ARTEMIS ETP.

In addition, each Artist2 partner has an outstanding track record for interaction with industry. Globally, the Artist2 consortium has a very strong impact on European R&D in embedded systems. This impact is visible via the achievements in Integrated Projects and STREPs (see below).

1.3.5 Course Materials

Artist2 disseminaes recent, high-quality Course Materials via its web portal: http://www.artist-embedded.org/artist/-Course-Materials-.html

This includes materials generated in Artist2 events, as well as pointers to high-quality materials from other sources.

2. International Collaboration

2.1 Year 3 Event: First European-SouthAmerican School for Embedded Systems

http://www.artist-embedded.org/artist/Objectives.html

August 21-24, 2007 Universidad Argentina de la Empresa (UADE), Buenos Aires – Argentina

Organised and funded by Artist.

2.1.1 Objectives

The purpose of the school is to foster the well established and dynamic research cooperations in the field of embedded systems between groups in Europe and South America, by allowing south-american students (specially graduate), to meet european researchers. We strongly believe this will offer an excellent opportunity to strengthen the relationships with mutual benefit.

The school will be a repeated event on a yearly basis. Besides the lectures given by european researchers, there will be invited talks by southamerican researchers and space (poster session) for graduate students to present and discuss their work.

2.1.2 Lecturers

The courses were given by ARTIST members Joseph Sifakis (VERIMAG), Gerhard Fohler (Kaiserlautern), and Luis Almeida (Aveiro). There were 15 10-minute long poster presentations of ongoing work by southamerican PhD students, covering a broad spectrum of hot topics related to ARTIST roadmap, including scheduling, modeling, verification, power and memory management, RTOS, and wireless and sensor networks.

Lecturers

Joseph Sifakis

A framework for component-based construction

VERIMAG Laboratory, Grenoble, France

- Joseph Sifakis is CNRS researcher and the Director of Verimag Laboratory in Grenoble, France. He studied Electrical Engineering at the Technical University of Athens and Computer Science at the University of Grenoble.
- Joseph Sifakis worked on both theoretical and practical aspects of Concurrent Systems Specification and Verification. He contributed to the development of the state of the art in verification methods and tools by model-checking for both untimed and timed systems. His current research interests include modeling, design and analysis of real-time systems with a focus on composability and compositionality. (Further information: here).
- Joseph Sifakis is a member of the editorial board of several journals, co-founder of the CAV (Computer Aided Verification) conference and a member of

the Steering Committee of the EMSOFT (Embedded Software) conference. He is the recipient of the CNRS Silver Medal in 2001.

- Joseph Sifakis is the scientific coordinator of the ARTIST2 European Network of Excellence on Embedded Systems Design.

Gerhard Fohler

Adaptive real-time systems

Technische Universitaet Kaiserslautern, Germany

- Gerhard Fohler is professor for real-time systems at the Technische Universitaet Kaiserslautern, Germany. He received his Ph.D. from Vienna University of Technology and worked at the University of Massachusetts at Amherst as postdoctoral researcher. Before joining TU Kaiserslautern, he was professor and Malardalen University Sweden.
- His research interests are in adaptive real-time systems, in particular combined scheduling schemes, such as offline and online. Recently, he has been involved in applying real-time resource management for media processing and video streaming.
- Currently, he is chairman of the Technical Committee on Real-Time Systems of EUROMICRO, member of the executive team of the IEE Professional Network on Embedded Systems and the IEEE Technical Committee on real-time systems. Gerhard Fohler has been active with international conferences and chair and program chair of the leading real-time conferences.

Luis Almeida

Networks for embedded control systems

Universidade de Aveiro/IEETA, Portugal

- Luis Almeida is currently a professor of the Electronics, Telecommunications and Informatics Department (DETI) of the Universidade de Aveiro (UA), and Coordinator of the LSE, a research laboratory of the IEETA research unit (Instituto de Engenharia Electrónica e Telemática de Aveiro) at the same university. He belongs to the Scientific Board of IEETA and he is a senior member of the IEEE, Computer Society.
- Luis Almeida has coordinated the LSE since 2003, being currently interested in real-time communication protocols for embedded systems with an emphasis on mechanisms to support predicatble operational flexibility.
- He is a co-author of more than 80 refereed publications in international scientific conferences and journals in the area, and co-author of 3 patents and 3 book chapters. He has given several invited talks and short courses about related topics and supervised several PhD students and Post-Doc visits to the LSE. He regularly participates in the organization of scientific events in the Real-Time Systems and Robotics communities.

2.1.3 Organisation

Besides ARTIST financial support to cover lecturers' travel and local expenses, the school received a total of 2100 USD, including 1500 USD from CLEI (Conferencia Latinoamericana de Informatica), and 600 USD from Microsoft Argentina. These funds were used to partially covered participants' travel expenses (no registration fees were charged): all PhD students received financial support for at least 80% of their costs. Local organization costs and coffee breaks were fully covered by UADE.

Conferencia Lationamericana de Informática (CLEI)

Microsoft Argentina

Scientific Committee

- Victor Braberman, Universidad de Buenos Aires, Buenos Aires, Argentina.
- Pedro D'Argenio, Universidad Nacional de Cordoba, Cordoba, Argentina.
- Markus Endler, PUC-Rio, Rio de Janeiro, Brazil.
- Jean-Marie Farines, Universidade Federal de Santa Catarina, Florianopolis, Brazil.
- Joni da Silva Fraga, Universidade Federal de Santa Catarina, Florianopolis, Brazil.
- Gerhard Fohler, University of Kaiserslauten, Kaiserslautern, Germany.
- Julius Leite, Universidade Federal Fluminense, Rio de Janeiro, Brazil.
- George Lima, Universidade Federal da Bahia, Bahia, Brazil.
- Alfredo Olivero, Universidad Argentina de la Empresa, Buenos Aires, Argentina.
- Rodrigo Santos, Universidad Nacional del Sur, Bahia Blanca, Argentina.
- Joseph Sifakis, CNRS-VERIMAG, Grenoble, France.
- Sergio Yovine, CNRS-VERIMAG, Grenoble, France.

Programm

The programme consisted in 3 daily 2-hour long courses, plus a poster presentation session followed by open and lively discussions about the lectures and current research directions on embedded systems.

2.1.4 Participants

The were a total of 66 registered participants, with a regular daily assistance to lectures of about 50. The large majority of participants were PhD students (28), mostly from Argentina (17) and Brazil (7). The scientific level of PhD students was recognised to be very good (many of them already published in top-ranked conferences and journals in the filed), as became apparent during the short presentations of their ongoing research works. The table below summarizes the distribution of participants according to their position and country.

	Engineer	Masters	PhD	Professor	**Total Result**
Argentina	5	4	17	8	**34**
Brazil	2	11	7	3	**23**
Europe			1	4	**5**
Mexico			1		**1**
Uruguay			2	1	**3**
Total Result	**7**	**15**	**28**	**16**	**66**

2.1.5 Conclusion

The courses were quite interactive, and generated interesting discussions during coffee breaks and lunches at the school's site, as well as during social dinners in restaurants nearby. The exhibition of posters greatly contributed to motive interactions between participants and lecturers. We believe this first edition achieved the desired purpose of the school of promoting and fostering research cooperations in the field of embedded systems between groups in Europe and South America. We are aware of several actions which have been undertaken in order to try to formalize cooperations, for instance, via research projects and collaboration networks. There has been a strong request to keep on organizing the school, with a general agreement to locate it in Brazil next year (the place is still to be decided, but there are already a couple of proposals).

2.2 Year 3 Event: ARTIST2 / UNU-IIST Spring School in China 2007

http://www.artist-embedded.org/artist/Overview,603.html

August 1-10 2007 Suzhou (near Shanghai)

Organised and funded by Artist.

2.2.1 Overview

ARTIST2 funded and organized, in collaboration with UNU-IIST, the 2nd edition of a school on embedded systems design in Suzhou (near Shanghai), August 1-10 2007.

2.2.2 Last Year's Edition

The 2006 edition of the school gathered more than 50 participants, of which approximately 40 were students from the top universities in mainland China: Peking University; Nangjing University; Institute of Software, Chinese Academy of Science; East China Normal University; Southwest University; Xidian University; Wuhan University; Northwest University; ZhengZhou University; Northwest Polytechnical University; National University of Defense Technology.

2.2.3 Lecturers

Prof. Karl-Erik Arzen

Lund University, Sweden

- Karl-Erik Årzén was born in Malmö, Sweden on October 4, 1957. He received his M.Sc in Electrical Engineering and PhD in Automatic Control from Lund University in 1981 and 1987 respectively. He was appointed as professor in automatic control in 2000. He has also worked for ABB Corporate Research during 1992-1994.
- His research interests includes real-time systems, real-time and embedded control, control of computer software systems, discrete event and sequential control, and intelligent control systems. He has published more than 120 journal articles and conference papers.
- He is the leader of the Control for Embedded Systems cluster within the EU/IST Network of Excellence ARTIST2 since 2004. He was the chairman of the IEEE Control System Society Technical Committee on Real-Time Control, Computing, & Signal Processing 1999-2002. He is vice chairman of the IFAC Technical Committee on Real-Time Computing & Control since 2002.
- In 2006 he received the Guido Carlo-Stella award from the World Batch Forum for his contributions to manufacturing automation.

Prof. Dr. Luca Benini

University of Bologna, Italy

- Luca Benini is a Full Professor at the Department of Electrical Engineering and Computer Science (DEIS) of the University of Bologna. He also holds a visiting faculty position at the Ecole Polytechnique Federale de Lausanne. He received a Ph.D. degree in electrical engineering from Stanford University in 1997.
- Dr. Benini's research interests are in the design of system-on-chip platforms for embedded applications. He is also active in the area of energy-efficient smart sensors and sensor networks. He has published more than 300 papers in peer-reviewed international journals and conferences, four books and several book chapters. He has been program chair and vice-chair of Design Automation and Test in Europe Conference. He has been a member of the technical program committee and organizing committee of several technical conferences, including the Design Automation Conference, International Symposium on Low Power Design, the Symposium on Hardware-Software Codesign.
- He is Associate Editor of the IEEE Transactions on Computer Aided Design of Circuits and Systems and the ACM Journal on Emerging Technologies in Computing Systems. He is a senior Member of the IEEE.

Paul Caspi

Verimag Laboratory, France

- Paul Caspi graduated from "Ecole polytechnique (Paris)" and holds a "docteur ès sciences" degree in automatic control from "Institut national polytechnique de Grenoble. He is currently "directeur de recherche CNRS" at the Verimag laboratory in Grenoble.
- His domain of interest is computer science applied to automatic control. He is mainly concerned with safety problems in critical applications, from both hardware and software points of view. This has led him to be involved in the design of Lustre, a data-flow programming language for safety-critical automatic control applications. Lustre has been chosen as the kernel language of the SCADE design environment used at Airbus for designing the flight control systems of Airbus commercial aircrafts. This achievement owed him to share the Monpetit prize of French "Académie des sciences".
- He also served as a consultant for several French companies and administrations, on problems related to safety-critical computing systems.

Kim Larsen

Aalborg University Denmark

- Kim Guldstrand Larsen (born 23 December 1957) holds an MSc in Mathematics and Computer Science from University of Aalborg, Denmark, and a PhD in Computer Science from Edinburgh University, Scotland. He is a Professor of Computer Science at Aalborg University, and Industrial Professor at Twente University, The Netherlands. In addition, Kim Guldstrand Larsen has visited, or has held visiting appointments, at research centres like ENS Cachan (France), Swedish Institute of Computer Science (Sweden), Uppsala University (Sweden), Twente University (The Netherlands) and Carnegie-Mellon University (U.S.A).

- Kim Guldstrand Larsen is director of CISS, the Center for Embedded Software Center, co-director of BRICS, the center for Basic Research in Computer Science, and member of the strategic management board of the ARTIST2 Network of Excellence. Kim Guldstrand Larsen is member of the Royal Danish Academy of Sciences and Letters, Copenhagen, and is member of the Danish Academy of Technical Sciences. For a period of seven years he served as member of the Danish Natural Science Research Council.
- Kim Guldstrand Larsen became Honorary Doctor (Honoris causa) at Uppsala University in 1999 for his outstanding contributions to the popular verification tool UPPAAL. In 2005 he received the Danish Citation Laureates Award, Thomson Scientific, as the most cited Danish computer scientist in the period 1990-2004.

- Since 1987 Kim Guldstrand Larsen has written and/or edited 10 books, published 27 papers in international journals, and approximately 130 papers in international reviewed conferences. Kim has co-authored 6 software-tools, holds one patent and is prime investigator in the real-time verification tool UPPAAL (www.uppaal.com). Kim Guldstrand Larsen has given invited talks

and course all over the work, including North-America, China, India, and most European countries. Kim Guldstrand Larsen is currentley ranked no. Ranked 531 on Citeseer an has H-number 34 according to Google Scholar.

- Kim Guldstrand Larsen is editorial board member of the journals Formal Methods in System Design, Theoretical Computer Science and Nordic Journal of Computing. He is serving as a member of the steering committee for the ETAPS conference series. Also he is serving as member of the steering committees and was one of the original initiators for the CONCUR conference series, the TACAS conference series and the FORMATS workshop seriesl. n addition Kim Guldstrand Larsen has served as program committee member for numerous conferences and acted as program chair and organiser of the international conferences ICALP'98, CONCUR'01, CAV'02 and FORMATS'03.

2.2.4 Course Materials

SoC platforms: modeling and analysis (Luca Benini *University of Bologna*)

- SoC technology
- Silicon technology trends and challenges
- Application drivers
- Architecture evolution

MPSoCs - Multi-core HW platforms (Luca Benini *University of Bologna*)
Why MPSoCs:
- technology challenges
- application challenges
- MSoC architectures
- Case studies

MPSoCs - Software platforms (Luca Benini *University of Bologna*)
- the software challenges
- System software - middleware
- Case studies: Industrial standardization intiatives

Design technology for MPSoCs (Luca Benini *University of Bologna*)
- Analysis of non functional properties (eg. power, reliability)
- Mixed simulation / formal approaches

Introduction to Feedback Control (Karl-Erik Arzen *Lund University)*
The role of feedback. Models and linearization. Stability. State-space and input-output models. Pole-placement. State-feedback and observers. Feedforward.

Computer Implementation of Control Systems (Karl-Erik Arzen *Lund University)*
Discretization of continuous-time control designs. Discrete-time control design. Aliasing. Anti-windup. Mode-handling. Numerics. PID control example. Task models for control.

Interaction between Control and Scheduling (Karl-Erik Arzen *Lund University)*
Interaction between control design and computer implementation. Temporal robustness. The effects of latencies and jitter on control performance. The Jitter Margin. The Control Server Model. Networked Embedded Control.

Co-Design Tools (Karl-Erik Arzen *Lund University)*
TrueTime – co-simulation of real-time kernels, networks, and continuous plants. Jitterbug – analytical temporal robustness evaluation of control loops. Several examples and demos will be shown.

Control of Computer Systems (Karl-Erik Arzen *Lund University)*
Examples of feedback in computer and communication systems. Queue-length control. Control of web-servers. Feedback scheduling in control systems. Feedback-based resource management. Control in Communication Networks.

Model-based Development for Embedded Control Systems (Paul Caspi *Verimag*)
Introduction and Conclusion
Modelling
- Simulink
- Stateflow

Code generation
- Single-thread
- Multi-thread

Faithfulness
- Models in computing and control
- Sampling
- Hybrid systems

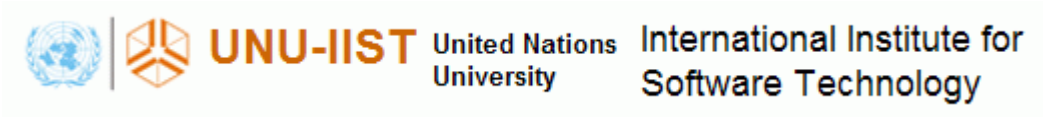
Validation of Real Time and Embedded Systems (Kim Larsen *Aalborg University)*
- Introduction: Validation of Real Time and Embedded Systems using UPPAAL
- Modelling, Specification, and Verification using UPPAAL
- Finite State Model Checking
- Timed Automata – Decidability Results
- Optimal & Real Time Scheduling
- Real Time Controller Synthesis
- Real Time Testing using UPPAAL
- Applications

2.2.5 Organisation

The ARTIST2 / UNU-IIST / China Summer School 2007 is organized jointly by the ARTIST2 Network of Excellence (European Commission's IST programme), the International Institute for Software Technology of the United Nations University (UNU-IIST, Macao).

It is sponsored by the European Commission.

In China, it was supported by the following major research institutions:
- Shanghai Embedded Systems Institute (SESI),
- Chinese Academy of Sciences' ISCAS laboratory,
- China Computer Foundation (CCF) Technical Committee on Theorectical Computer Science (chairman: Prof. Huowang Chen; secretary, Prof. Jianping Yin).



State Key Laboratory of Computer Science
Institute of Software
Chinese Academy of Sciences

Shanghai
Embedded Systems
Institute

Coordination Committee

- Zhou Chaochen, Academician of CAS, Institute of Software, CAS, Beijing
- He Jifeng, Academician of CAS, East China Normal University, Shanghai
- Wang Ji, National Lab for Parallel and Distributed Computing, Changsha
- Zhiming Liu, UNU-IIST, Macao
- Zhu Qiaoming, Suzhou University, Suzhou
- Zhou Xinshe, North West Polytechnic Univeristy, Xi'an
- Li Xuandong, Nanjing University, Nanjing
- Bruno Bouyssounouse (Artist2 NoE)
- Joseph Sifakis (Verimag)
- Wang Yi (Uppsala University)

2.2.6 Poster for the school

2.2.7 Participants

RETIS Lab, Scuola Superiore Sant'Anna/Italy
Yifan Wu/Male Ph.D, Yao Gang/Male Ph.D, student, Nicola Serreli/Male Ph.D, student.

Hong Kong University of Science and Technology/China
Zonghua Gu/Male Assistant Professor, Nan Guan/Male Ph.D, student of Prof. Gu, Xiuqiang He/Male Ph.D, student of Prof. Gu, Weichen Liu/Male Ph.D, student of Prof. Gu, Mingxong Lv/Male Ph.D, student of Prof. Gu, Mingxuan Yuan/Male Ph.D, student of Prof. Gu, Wanwei Liu/Male Ph.D candidate.

Institute of Software, CAS/China
Nasro Min Allah/Male Ph.D, student, Guanyuan Li/Male Research fellow , Yongjian Li/Male Research fellow, CAS Xueyang Zhu/Male Assistant researcher , Naijun Zhan/Male Ph.D.

Sweden
Yue Lu.

IRIT-ACADIE,Universite Paul Sabatier, /FRANCE
Lei Pi/Male Ph.D, student.

National University of Defense Technology/Changsha, China
Hai Huang/Male MSC candidate.

Hangzhou Dianzi University
Peng Liu/Male Lecturer.

College of Computer Science, Electronic technique University of Hangzhou/
Hangzhou Zhigang Gao/Male Achieving Msc in Lanzhou University.

NorthWestern Polytechnical University
Changde Li/Male Ph.D candidate , Yuying Wang/Female Ph.D candidate , Liang Ke/Male Ph.D. candidate, Kailong Zhang/Male Ph.D. candidate , y Fan Zhang/Male Lecturer, Yunwei Dong MSc, Daoming Wang MSc, Jia Liu/Female, Tao Zheng/Male MSc.

National University of Defense Technology/Changsha, China
Changzhi Zhao/Male Ph.D. candidate.

National University of Defense Technology
Feng Liu/Male Ph.D. candidate , Renjian Li Ph.D candidate ,

Shanghai University/Shanghai, China
Yihai Chen Lecturer.

Zhejiang University/Hangzhou, China
Xingfa Shen/Male Ph.D. candidate.

Soochow University/Suzhou, China
Chuanhui Liu/Male MSc candidate, He BSc, Sheng Wang BSc, Pingfu Li MSc, Sheng Wang MSc, Miao Lin MSc, Mei Zhang MSc, Xiaomeng Zhang MSc, Yi Zhu Ph.D candidate, Lifen Zhao MSc, Wei Zhao MSc.

School of Computer, National University of Defense Technology/Changsha, China
Jianjun Xu/Male MSc.

Peking University/Beijing, China
Shu Qin/Female Ph.D candidate, Liyang Peng/Male.

Nanjing UniversityNanjing, China
Bin Lei/Male Ph.D candidate, Minxue Pan/Male MSc, Jianwen Tang/Female MSc, Zhanqi Cui/Male MSc, Qian Li/Female BSc, Song/Male MSc, Enyi Tang/Male MSc, Lei Bu/Male BSc, Jinglin Du/Male PhD. candidate, Xiaofeng Tang/Male, Chao Yang/Male, Tao Zhang/Male, Bixin Li/Male Ph.D supervisor, Chao Sun BSc, Zhenbang Chen Ph.D candidate, Xi Liu//Male BSc ,

Jiangxi Normal UniversityNanchang, China
Qimin Hu/Male MSc.

Hunan university/Changsha, China
jun Hu/Male Lecturer/Ph.D, Yan Liu/Male Ph.D candidate, Kehuan Zhang/Male Ph.D candidate, Kehua Yang Lecturer/Ph.D, Daoxi Chen MSc, Fengjuan Yao/Female Ph.D candidate.

Tongji university/Shanghai, China
Miaomiao Zhang/Female Ph.D, Xuyi/Male MSc, Min Hu/Male, JIng Zhang/Female MSc.

Shanghai University
Chenghao Xie/Male MSc.

Beihang University/Beijing, China
Shilin Huang/Male MSc, Zhibin Yang/Male Ph.D candidate.

Northeastern University/Shenyang, China
Ying Liu/Female MSc, Wanbo Gao/Male MSc, Hongyu Zhang/Male MSc, Yuelin Li/Male MSc, Yi Zhang/Male MSc, Deng Qingxu.

UNU-IIST/Macao, China
Ukachukwu Ndukwu/Male Ph.D candidate, Kamel BOUMAZA.

Guizhou UniversityGuiyang, China
Yang bo/Female MSc.

Tongji Unversity
Yu'an Chen/Male MS.

Southwest Jiaotong University/Chengdu, China
Li Yun Ph.D, Xie Gang, Li changqing .

Xihua University/Chengdu, China
Lu Yuan Ph.D, Fan Yong-quan Ph.D.

China East Normal University/Shanghai, China
Libo Feng/Feng, Juan Zhou/Femal, Chengjie Shen/Male, Qin Li/Male, Huibiao Zhu/Male Lecturer, Yifeng Chen/Male, Naiyong Jin/Male.

Shantou University/Shantou, China Shiwei Yang/Male, Rongqing Yang/Male, Laiqiong Yan/Male, Pengsheng Wang/Male, Zhi Wang/Male, Junwei Chen/Male, Weipeng Zhong/Male, Feifei Lin/Female, Hu Yan/Female, John Koo.

Zhejiang University/Hangzhou, China
Nenggan Zheng, Peifeng Zhang.

2.3 Year 3 Event: ARTIST2 Workshop on Foundations and Applications of Component-based Design

October 26th, 2006 Seoul, South Korea
http://www.artist-embedded.org/artist/Overview,29.html

Artist2 organised and funded this event, within EMSOFT'06, at the Embedded Systems Week.

2.3.1 Objectives and scope

Discuss recent results on component-based design with emphasis on design frameworks for real-time systems encompassing heterogeneous composition and models of computation. Especially frameworks for handling non-functional and resource constraints, design under conflicting dependability criteria, trade-offs between average performance and predictability.

The workshop aims to gather together researchers from computer science and electrical engineering and will seek a synthesis between the the underlying paradigms and techniques. The focus is not only on fundamental results but also on their implementation in methods and tools and their concrete application in areas such as automotive, avionics, consumer electronics and automation.

The workshop will address specific challenges such as:

- Foundations and Expressiveness of System Description Formalisms
  - What are the basic concepts for describing components?
  - What types of component interaction that are directly supported?
  - What kind of resources can be modeled and are they first class citizens of the formalism (energy, memory, time, ...)?
  - How do you think the following models, styles and design principles are interrelated and can be combined:
    - synchrony vs. asynchrony
    - event-triggered/data-triggered/time triggered
    - separation of concerns

- Component-based Design, Methods and Tools
  - What kind of analysis methods are or should be supported?
  - Compositional verification techniques
  - resource usage (such as energy, time, memory)
  - What kind of design methods are or should be supported?
    - property preserving structuring principles
    - refinement/implementation relations
  - What kind of tradeoffs between predictability and efficiency can be exploited?
  - What kind of implementation methodologies do the proposed formalisms support and what kind of tools are or could be made available?
  - Application Scenarios and Relevant Case Studies
    - What kind of applications have been or should be looked at that illustrate the above issues?

Format
The workshop will be comprised of invited and contributed presentations, as well as dedicated discussion sessions, ordered according to the topics given above.

2.3.2 Organisation

Programme Chairs

- **Joseph Sifakis** (co-chair)
  Verimag Laboratory
- **Lothar Thiele** (co-chair)
  ETH Zurich

Programme Committee

- **Rajeev Alur**
  University of Pennsylvania
- **Rolf Ernst**
  Braunschweig Technical University
- **Tom Henzinger**
  Ecole Polytechnique Fédérale Lausanne (EPFL)
- **Edward A. Lee**
  University of California at Berkeley
- **Alberto Sangiovanni–Vincentelli**
  University of California at Berkeley
- **Wayne Wolf**
  Princeton University

Organization

- **Bruno Bouyssounouse**
  Verimag Laboratory

2.3.3 Programme and Slides

within EMSOFT'06, at the Embedded Systems Week in Seoul, Korea.

Introduction

Edward A. Lee (UC Berkeley) (invited talk)
Causality Interfaces for Actor Networks

Sankalita Saha, Dong-Ik. Ko, and Shuvra S. Bhattacharyya (University of Maryland)
A Meta-modeling Framework for Dynamic Reconfiguration of Dataflow Graphs

Janos Sztipanovits, (Institute for Software Integrated Systems ISIS)
Towards the Compositional Specification of Semantics for Heterogeneous Domain-Specific Modeling Languages

Ingo Stierand and Werner Damm (University of Oldenburg)
Cyclic Timed Interfaces

Thomas A. Henzinger (EPFL and UC Berkeley, and Slobodan Matic, UC Berkeley)
An Interface Algebra for Real-Time Process Graphs

Hans-Gerhard Gross and Arjan van Gemund (Delft University of Technology)
Bridging the Gap between Non-formal and Formal Software Component Requirements Specifications for Embedded System Engineering

Joern Janneck (XILINX) (invited talk)
Building a System from Actors

Kai Richter and Marek Jersak and Arne Hamann and Rolf Ernst (Symtavision GmbH) (Technical University of Braunschweig)
Scheduling Analysis in the Automotive Design Flow

Hugo Andrade, John Breyer, Gerardo Garcia, and Jacob Kornerup, National Instruments Corporation
A Unified Graphical Representation and Tool for Design and Integration of Components in Heterogeneous Distributed Real-Time Systems

Ananda Basu, Marius Bozga and Joseph Sifakis, and Gregor Gößler, (VERIMAG) (INRIA Rhône-Alpes)
Component-based Construction of Real-time Systems in BIP

Abhik Roychoudhury and P.S. Thiagarajan (National University of Singapore)
A Verification Framework for Interacting Process Classes

Lothar Thiele, Ernesto Wandeler, and Nikolay Stoimenov (ETH Zurich)
Real-Time Interfaces

Cheng-Yao Chen, Jason Schlessman, and Wayne Wolf (Princeton University)
Towards Accessible Real-Time Distributed Embedded Vision Middleware

2.4 Year 3 Event: WESE'06 - Embedded Systems Education

October 26th, 2006 Seoul, Korea
http://www.artist-embedded.org/artist/WESE-06.html

Organised and funded by Artist within EMSOFT'06, at the Embedded Systems Week.

2.4.1 Overview

It is widely recognized that the embedded system domain is a multidisciplinary one, requiring a large variety of skills from control and signal processing theory, electronics, computer engineering and science, telecommunication, etc., as well as application domain knowledge. This has motivated a recent but ever growing interest in the question of educating specialists in this domain and this has also been recognized as a particularly difficult problem. After a successful first event in Jersey City, USA (2005), this second workshop on the subject aims to bring researchers, educators, and industrial representatives together to assess needs and share design, research, and experiences in embedded systems education.

Topics and Focus
Particular topics of interest include but are not limited to:

- Industrial needs regarding embedded systems education
- Embedded systems curricular design and implementation
- Control and signal processing issues
- Computer science issues
- Real-time computing issues
- Distributed systems issues
- Architecture and design issues
- Hardware/software co-design
- Hands-on experiences and labs

- Teaching embedded systems

2.4.2 Organisation

2.4.2.1 Organizing Committee

- Jeff Jackson, The University of Alabama, USA
- Paul Caspi, Verimag-CNRS, France
- Jogesh Muppala, The Hong Kong University of Science and Technology, Hong Kong
- Wayne Wolf, Princeton University, USA
- John K. Zao, National Chiao Tung University, Taiwan

2.4.2.2 Program Committee

- Tom Conte, North Carolina State University, USA
- Mats Daniels, Uppsala University, Sweden
- Jen Davoren, The University of Melbourne, Australia
- Jin Hyung Kim, KAIST, South Korea
- Yann-Hang Lee, Arizona State University, USA
- Kenneth G. Ricks, The University of Alabama, USA
- Chi-Sheng (Daniel) Shih, National Taiwan University
- Hiroto Yasurra, Kyushu University, Japan

2.4.3 WESE 2006 Program

Education Programs and Embedded Systems Consortia

- Stylianos Mamagkakis (IMEC) :
Research Network for System Level Design of Embedded Systems: Dynamic Memory Allocation Design Flow Case Study
- Kenji Hisazumi (Kyushu University)
QUBE: A Practical Education Program for System LSI Designers
- Tai-Yi Huang (National Tsing Hua University):
An Update on the Embedded Software Consortium of Taiwan

Embedded Systems Courses and Curricula Issues

- Tulika Mitra (National University of Singapore):
Challenges in Designing Embedded Systems Courses
- Kenneth Ricks (University of Alabama):
Addressing Embedded Programming Needs within an ECE Curriculum
- Jogesh K. Muppala (Hong Kong University of Science and Technology):
Bringing Embedded Software Closer to Computer Science Students
- Shiao-Li Tsao (National Chiao Tung University, Hsinchu, Taiwan):
The Development and Deployment of Embedded Software Curricula in Taiwan

Embedded Systems Hardware and Methodologies

- Shekhar Sharad: Methodologies to Bring Embedded Systems to Non-EE Students (not delivered)
- Shanq-Jang Ruan (National Taiwan University of Science and Technology):
Development and Analysis of Power Behavior for Embedded System Laboratory
- Chi-Sheng Shih (National Taiwan University):
Toward HW/SW Integration: Networked Embedded System Design
- Falk Salewski (RWTHAACHEN University):
Hardware Platform Design Decisions in Embedded Systems A Systematic Teaching Approach

Embedded Systems Curricula, Programs and Projects

- Kolin Paul: Experiences of a Summer Workshop in Embedded Systems (not delivered)
- Hans-Gerhard Gross (Delft University of Technology):
The Delft MS Curriculum on Embedded Systems
- Martin Törngren (The Royal Institute of Technology, Stockholm):
Experiences from large embedded systems development projects in education, involving industry and research
- Lindsay T. Kane (Microsoft):
The Windows Embedded Academic Program – Retrospective & Directions, 2002-2006
- Masaki Yamamoto (Nagoya University):
An Extension Course for Training Trainers of Embedded Software

To access the published Program please click here.

2.4.4 Sponsors

The ARTIST2 Workshop on Embedded Systems Education - WESE'06 is sponsored by:

- ACM
- ARTIST2

2.5 Events Planned for Year 4

2.5.1 WESE'07: WS on Embedded Systems Education

October 4-5, 2007 Salzburg, Austria (within ES Week)
http://www.artist-embedded.org/artist/WESE-07.html

Organised and funded by Artist.

2.5.1.1 Overview

It is widely recognized that the embedded system domain is a multidisciplinary one, requiring a large variety of skills from control and signal processing theory, electronics, computer engineering and science, telecommunication, etc., as well as application domain knowledge.

This has motivated a recent but ever growing interest in the question of educating specialists in this domain and this has also been recognized as a particularly difficult problem.

This third workshop on the subject aims to bring researchers, educators, and industrial representatives together to assess needs and share design, research, and experiences in embedded systems education.

2.5.1.2 Organisation

Organisers

- Jeff Jackson, The University of Alabama, USA
- Martin Törngren, Royal Institute of Technology, Sweden

Program Committee

- Reiner Hartenstein, Kaiserslautern University of Technology, Germany
- Yann-Hang Lee, Arizona State University, USA
- Jogesh Muppala, The Hong Kong University of Science and Technology, Hong Kong
- Kenneth G. Ricks, The University of Alabama, USA
- Falk Salewski, Aachen University, Germany
- Chi-Sheng (Daniel) Shih, National Taiwan University, Taiwan
- Stewart Tansley, Microsoft, Redmond, WA, USA
- Wayne Wolf, Princeton University, USA

2.5.1.3 Programme

October 4, 2007

Opening

Embedded Systems Courses and Curricula I

Jim Hamblen - Georgia Institute of Technology
An Undergraduate Embedded Systems Design Course Based on a Commercial Embedded Operating System

Embedded Systems Courses and Curricula II

Chen Tianzhou - ZheJiang University
The 7 Years Embedded System Education in China

Yu-Lun Huang - National Chiao-Tung University
The Curriculum and Teaching Laboratory for Embedded Systems

Kuo Chen Wu
The Development of Training Course for Embedded Middleware Design

Skills and Learning in Embedded Systems Education

Antti Piironen - EVTEK University
Problem Based Learning of Embedded Systems Design

Peter Bertels - Ghent University
Gathering Skills for Embedded Systems Design

SoC in Embedded Systems Education

Chian C. Ho - National Yunlin University
Design Methodology and Lab Example of Soft Speech Codec on Nios II Embedded Platform

Yi-Jung Chen - National Taiwan University
SoC System Design Program for Computer Science Majors

Roundtable Discussion I
- **Workshop attendee roundtable discussion: Current and Future Embedded Systems Education Issues**

October 5, 2007

Higher-Level Issues in Embedded Systems Education

Jeff Jackson - The University of Alabama
Addressing System-Level Concepts in Embedded Systems Education

Ting-Wei Hou - National Cheng Kung University
A Step toward Embedded Programming in High Level Languages

Roundtable Discussion II
- **Workshop attendee roundtable discussion: Where do we go from here?**

2.5.2 Artist2 meeting on Integrated Modular Avionics

November 12-13, 2007 Roma, Italy
http://www.artist-embedded.org/artist/Integrated-Modular-Avionics.html

Organised and funded by Artist.

2.5.2.1 Presentation and Aim

Today, the exponentially increasing diversity of airborne systems results in an ever increasing number of computers and controllers for system management, monitoring, and control. The development of specific ad-hoc solutions causes increases in costs, which in turn impacts purchase prices and operational costs. To overcome this, standardization principles and reuse of function units are now considered, via Integrated Modular Avionics.

Integrated Modular Avionics (IMA) has set the principles of standardized components and interfaces of hardware and software in aircraft. These principles have been applied for the first time in the development of the Airbus A380. Further developing IMA raises a number of issues that require fundamental research efforts, in tight coordination with engineering needs.

ARTIST2, the European Network of Excellence on embedded systems has decided to organize, as part of its activity on "scientific challenges in specific industrial sectors", a two-day workshop dedicated to Systems, Software, and Architecture, aspects of IMA.

The workshop aims to analyze:

- the issues and difficulties encountered by aircraft manufacturers and their suppliers,
- the specific research problems that result from the above issues, and,
- the recent advances in research that may contribute to overcoming the above difficulties.

2.5.2.2 Organisation

This workshop is organised by the Artist2 Network of Excellence on Embedded Systems Design:

- Albert Benveniste (INRIA)
- Paul Caspi (Verimag)
- Bengt Jonsson (Uppsala)
- Werner Damm (Offis)
- Joseph Sifakis (Verimag)
- Bruno Bouyssounouse (Verimag)

The meeting will be co-chaired by:
- Albert Benveniste (INRIA, responsible for minutes)
- Alberto Ferrari or Alberto Sangiovanni-Vincentelli (PARADES, chairing sessions)

Logistics
This workshop will be held at Parades Laboratory**,** in the historical center of Roma, Via di San Pantaleo 66, 00186 Roma.
To allow for tight and fruitful interaction, the attendance is limited to 50 participants.

2.5.2.3 Programme

November 12th - morning

- Alberto Ferrari or Alberto Sangiovanni-Vincentelli, PARADES
  Welcome address
- Jean-Bernard Itier, Airbus
  The AIRBUS approach to open Integrated Modular Avionics (IMA), Technology, Methods, Process and Future needs
- Thierry Cornilleau, Dassault-Aviation
  Lessons learned by Dassault-Aviation from military and civil IMA applications
- Michael Winokur, Israeli Aerospace Industries
  Requirements and architecture of modular avionics in novel types of applications

November 12th - afternoon

- Peter Feiler, SAE AADL Committee
  IMA: The Good, The Bad, and The Ugly
- John Rushby, SRI
  Compositional Assurance for IMA
- Paul Caspi, Verimag
  Some issues about IMA in safety critical applications
- Gert Doehmen, Airbus
  Embedded System Development for Distributed Networked Computing Platforms
  Speeds project and its contribution to IMA [title+abstract required]
- Roman Obermaisser, TU Vienna
  Supporting Heterogeneous Applications in the DECOS Integrated Architecture

November 13th - morning

- Kevin Driscoll, Honeywell
  Honeywell requirements for IMA [title+abstract required]
- Alex Wilson (Windriver), OS
  Windriver solutions for IMA [title+abstract required]
- Chris J. Walter, WW Technology Group
  Dependable solutions for IMA

November 13th - afternoon

- **Panel Session on expectations from research for IMA**:
  statements from speakers and recorded discussion.
  This will be a structured panel involving the speakers, plus some additional panelists. Besides the usual statements and discussion, detailed conclusions and recommendations for research will be collected as part of the meeting minutes.

2.5.3 Second International Artist2 Workshop on Foundations of Component-based Design

September 30th, 2007 Salzburg, Austria - within EmSoft / ES Week
http://www.artist-embedded.org/artist/Foundations-of-Component-based.html

Organised and funded by Artist.

2.5.3.1 Objectives and Scope

Discuss recent results on component-based design with emphasis on design frameworks for real-time systems encompassing heterogeneous composition and models of computation. Especially frameworks for handling non-functional and resource constraints, design under conflicting dependability criteria, trade-offs between average performance and predictability.

The workshop aims to gather together researchers from computer science and electrical engineering and will seek a synthesis between the the underlying paradigms and techniques. The focus is not only on fundamental results but also on their implementation in methods and tools and their concrete application in areas such as automotive, avionics, consumer electronics and automation.

The workshop will address specific challenges such as:

- Foundations and Expressiveness of System Description Formalisms
  - What are the basic concepts for describing components?
  - What types of component interaction that are directly supported?
  - What kind of resources can be modeled and are they first class citizens of the formalism (energy, memory, time, ...)?
  - How do you think the following models, styles and design principles are interrelated and can be combined:
    - synchrony vs. asynchrony
    - event-triggered/data-triggered/time triggered
    - separation of concerns
- Component-based Design, Methods and Tools
  - What kind of analysis methods are or should be supported?
    - Compositional verification techniques

    - resource usage (such as energy, time, memory)
- What kind of design methods are or should be supported?
    - property preserving structuring principles
    - refinement/implementation relations
- What kind of tradeoffs between predictability and efficiency can be exploited?
- What kind of implementation methodologies do the proposed formalisms support and what kind of tools are or could be made available?

- Application Scenarios and Relevant Case Studies
    - What kind of applications have been or should be looked at that illustrate the above issues?

2.5.3.2 Organisation

Organisers

- Tom Henzinger (co-chair)
  Ecole Polytechnique Fédérale de Lausanne
- Werner Damm (co-chair)
  OFFIS

Publicity

- Bruno Bouyssounouse
  Verimag Laboratory

Logistics

- Karen Birkenstock
  OFFIS

2.5.3.3 Programme

Session 1: Components

Joseph Sifakis
The Algebra of Connectors: Theory and Applications

Alberto Sangiovanni-Vincentelli and Roberto Passerone
Contract-based formalisms for heterogeneous and hybrid systems

Martin Toerngren
A Holistic Approach to Model and Component-based Embedded Systems Engineering

Discussion

Session 2: Embedded Software

Albert Benveniste
A Generic Model of Contracts for Embedded Systems

Christoph Kirsch
Tiptoe: A Compositional Real-Time Operating System

Ansgar Radermacher
Component based middleware for real-time embedded systems 12:45-13:00Discussion

Session 3: Dependability, Predictability, and Reliability

Ed Brinksma
TRADER: an industry-as-laboratory experiment in system dependability

Bengt Jonsson
GALP: Globally approximate, locally precise timing analysis for predictability

Alain Girault
The Length-Reliability Bicriteria Scheduling and Optimization Problem

Discussion

Session 4: Verification

Kim Larsen
Performance Analysis and Synthesis

Dave Parker
Model checking of probabilistic systems

Johan Lilius
Specification and validation of non-functional constraints

Discussion

3. Organisation of Schools

3.1 Schools directly Organized and Funded by Artist2 in Year3

In Year 3, Artist2 has directly organized and funded the schools and courses.

First European-SouthAmerican School for Embedded Systems
August 21-24, 2007 Universidad Argentina de la Empresa (UADE), Buenos Aires - Argentina
The purpose of the school is to foster the well established and dynamic research cooperations in the field of embedded systems between groups in Europe and South America, by allowing south-american students (specially graduate), to meet european researchers.
http://www.artist-embedded.org/artist/Objectives.html

Artist2 / UNU-IIST School in China - 2007
August 1-10, 2007 Suzhou (near Shanghai), China
ARTIST2 will organize, in collaboration with UNU-IIST, the 2nd edition of a school on embedded systems design in Suzhou (near Shanghai).
http://www.artist-embedded.org/artist/Overview,603.html

ARTIST2 PhD Course on: Automated Formal Methods for Embedded Systems
June 4-12, 2007 DTU - Lyngby, Denmark
Embedded systems engage into an ongoing, hardly foreseeable, interaction with their asynchronously evolving environment. This fact contributes to the intrinsic complexity of their design and validation.
http://www.artist-embedded.org/artist/ARTIST2-PhD-Course-on-Automated.html

ARTIST2 Graduate Course on Embedded Control Systems
May 7-11, 2007 Lund, Sweden
The objective of the course is to provide an overview of the main principles and technologies for supporting the development of embedded control systems.
http://www.artist-embedded.org/artist/Course-Report.html

Real-Time Microcontroller Systems: OSEK Standard and experiments on µcontroller devices
March 26-28, 2007 RETIS Laboratory, Scuola Superiore Sant'Anna, Pisa, Italy
Training course on Real-Time Systems for Microcontrollers: OSEK Standard and experiments on microcontroller devices *Organised in conjunction with Evidence Srl.*
http://www.artist-embedded.org/artist/Course-Programme.html

ARTIST2 - MOTIVES 2007
February 19-23, 2007 Trento, Italy
ARTIST2 Winter School 2007 offers foundational tutorials and lectures on exciting emerging technologies and industrial applications - given by leading scientific and industrial experts.
http://www.artist-embedded.org/artist/Overview,577.html

3.2 Special Year 3 Event: ARTIST2 Winter School - MOTIVES 2007

ARTIST2 Winter School - MOTIVES 2007
February 19-23, 2007 Trento, Italy

MOdelling, TestIng, and Verification for Embedded Systems.
ARTIST2 Winter School 2007 offers foundational tutorials and lectures on exciting emerging technologies and industrial applications - given by leading scientific and industrial experts.

http://www.artist-embedded.org/artist/Overview,577.html
Organised and funded by Artist.

3.2.1 Overview

The Winter School offers a number of foundational tutorials, accompanied by a selection of lectures on exciting emerging technologies and industrial applications - given by leading scientific and industrial experts.

This 5-day winter school is for young researchers working or wanting to work in modelling, validation, synthesis and performance analysis of embedded systems, as well as engineers from industry with a practical background in design, control and testing of embedded systems.

The Winter School is organised by the ARTIST2 Network of Excellence, with strong contributions from three of its research clusters: Real-Time Components, Testing & Verification and Compilers & Timing Analysis.

The school is open for participation by all, although some previous training and/or experience in the fundamentals of computer science and a knowledge of computer architectures is required.

3.2.2 Organisation

Steering Committee

- Bengt Jonsson (Uppsala Univ., Sweden)
- Kim G. Larsen (Aalborg Univ., Denmark)
- Reinhard Wilhelm (Saarland University, Germany)

Organizational Committee

- Bruno Bouyssounouse (Verimag, France)
- Luigi Palopoli (University of Trento, Italy)
- Jan Reineke (Saarland University, Germany)

3.2.3 Programme

Modeling and Design of Heterogeneous Systems

Alberto Ferrari	PARADES	Modeling of Heterogeneous Systems in Metropolis
Joseph Sifakis	Verimag	Component-based Construction of Real-Time Systems
Roberto Passerone	Trento	Interface and component-based design for heterogeneous systems
Benoit Caillaud	INRIA	Composition and Transformation of Heterogeneous Real-Time Systems

Student Presentations*

A special student presentation session is scheduled for Monday evening. Students are invited to send a short abstract (about 200 words) to Jan Reineke (reineke AT cs.uni-sb.de) describing their PhD project and to make a poster (in A3 format). Posters will be presented during and informal get-together session with food and beverages.

Model Transformation and UML

Reiko Heckel	Leicester	Foundations of Model Transformation
Andy Schuerr	Darmstadt	MDD with OMG Standards MOF, OCL, QVT and Graph Transformations
Wang Yi	Uppsala	Schedulability Analysis of Timed Systems
Julio Medina	CEA/LIST	UML for scheduling Analysis

Static Analysis for Safety and Performance

Tutorials

Hanne Riis Nielson	DTU	Static Analysis for Safety and Security
Reinhard Wilhelm	Saarland	Timing Analysis for Real-Time Systems part 1 part 2
Samarjit Chakraborty	Singapore	Interactive Performance Debugging of Real-Time Systems part 1 part 2
Sylvie Putot	CEA	Abstract Interpretation of Floating-Point Computations
Joerg Bauer	Saarland	Static Analysis of Dynamic Communication Systems

Schedulability and Controller Synthesis

Jean-Francois Raskin	ULB	Controller Synthesis part 1 part 2

Joost-Pieter Katoen	Aachen	Soft Real Time Scheduling and Quality of Service
Kim Larsen	Aalborg	Optimal Scheduling and Controller Synthesis
Giuseppe Lipari	Sant'Anna	Contract-based Scheduling: An Overview of the Results of the FIRST EU Project

Testing and Run-Time Verification

Ed Brinksma	Embedded Systems Institute	Conformance Testing and Test Coverage part 1 part 2
Vlad Rusu	IRISA	Formal verification and testing for reactive systems
Bernd Finkbeiner	Saarland	Run-Time Verification

3.2.4 Participants

Affiliation	Name
Aalborg University	Istvan Knoll
Åbo Akademi University	Muhammad Mohsin Saleemi
CEA	François Lagarde
CEA -LIST	Frederic Loiret
DIT - UNITN	Francesco Leonardi
EDF	Alain Ourghanlian
ENS CACHAN IRISA	Benoît Delahaye
Faculty of informatics, Masaryk University	Pavel Šimček
Helsinki University of Technology	Jori Dubrovin
INRIA - Loria	Eun Young Kang
IRIT	Jean - François Rolland
IRIT ENSEE IHT	Tanguy Le Berre
ITC-IRST, Italy	Francesco Nesta
K.U.Leuven	Didier Delanote
Korea University	Dae Yon Hwang
Korea University	Jun-Kil Park
Korea University	Jae Hwan Sim
LSV - ENS	Florent Bouchy
LSV - ENS	Remi Brochenin
LSV - ENS	Najla Chamseddine
LSV - ENS	Ghassan Oreiby

Malardalen University	Hüseyin Aysan
Malardalen University	Moris Habib Yasi Behnam
Malardalen University	Andreas Hjertstrom
Malardalen University	Sèverine Sentilles
MCI, Mads Clausen Institute	Yu Guo
MCI, Mads Clausen Institute	Nicolae Marian
MDH/IDE	Marcelo Santos
National Istitution of Informatics	Kenji Taguchi
Saarland University	Jan Reineke
Scuola S. Anna	Marko Bertogna
Scuola Superiore S. Anna	Michele Cirinei
Technical Univ. of Denmark	Aske Brekling
TU - Berlin	Michael Beyer
TU Brannschveig, IPS	Jens Steiner
TU Vienna	Raimund Kirner
UCD Dublin	Eoin Bailey
UCD Dublin	Ross Shannon
Univeristy of Pisa	Adriano Fagiolini
Università dell'Aquila	Antonio Cicchetti
Università di Verona	Stefano Galvan
Universitè Joseph Fourier	Virginia Papailiopoulou
Universite Libre de Bruxelles	Gabriel Kalyon
Universite Libre de Bruxelles	Nicolas Maquet
University of Minho	Oscar Ribeiro
University of Trento	Anton Ageev
University of Trento	Asaula Ruslan
University of Trento	Alena Simalatsar
University of Trento	Andrey Somov
University of Twente	Hichem Boudali
UNSW Computer science	Blanca Mancilla
UNSW Computer science	John Place
Uppsala University	Leonid Mokrushin

3.2.5 Poster for the school

3.3 Schools Partially Organized and/or Funded by Artist2 in Year 3

Quantitative Aspects of Embedded Systems
March 4-9, 2007 Schloss Dagstuhl, Wadern, Germany
This Dagstuhl seminar will bring together experts in embedded software design and implementation, model-based analysis of quantitative system aspects, and researchers working on extending formal methods with quantitative system aspects.
http://www.artist-embedded.org/artist/Quantitative-Aspects-of-Embedded.html

CASTNESS'07 Workshop and School
January 15-17, 2007 Rome, Italy
Computing Architectures and Software Tools for Numerical Embedded Scalable Systems.
http://www.artist-embedded.org/artist/CASTNESS-07-Workshop-and-School.html

ADSD 2006: Advanced Digital Systems Design
September 25-29, 2006 Lausanne, Switzerland
Design course for multimillion-transistor Systems-on-Chip and other state-of-the-art embedded products. The course spans from purely digital-design topics to some compiler-related issues.

http://www.artist-embedded.org/artist/Overview,299.html

FOSAD 2006: 6th International School on Foundations of Security Analysis and Design
September 10-16, 2006 Bertinoro, Italy
The International School on Foundations of Security Analysis and Design (FOSAD) has been one of the foremost events established with the goal of disseminating knowledge in this critical area. The main aim of the FOSAD school is to offer a good spectrum of current research in foundations of security - ranging from programming languages to analysis of protocols, from cryptographic algorithms to access control policies and trust management - that can be of help for graduate students and young researchers from academia or industry that intend to approach the field.
http://www.artist-embedded.org/artist/FOSAD.html

MDD4DRES
September 4-8, 2006
A goal of this summer school is to provide participants with the information needed to understand and apply MDE approaches to the development of embedded systems. The summer school will also include lectures from experts in academia and industry on topics related to MDE practices and methods, and to emerging MDA technologies.
http://www.ensieta.fr/mda/ecoleMDA2006/index.php?r=1&Largeur=1280&Hauteur=1024&zoom=1&go=0&conf=&id=0&title="

3.4 Plans for Year4: Schools Directly Organized and Funded by Artist2

The following Artist2 schools are planned for Year 4:

- Artist2 Summer School in China
- Artist2 Summer School in Europe

3.5 Plans for Year4: Schools Partially Organized and/or Funded by Artist2

In addition, Artist2 plans to help fund and/or participates in the organisation of the following schools in the area.

EPSD 2007
September 10-14, 2007 EPFL, Lausanne, Switzerland

Advanced engineering courses will be offered by the Swiss Federal Institute of Technology, Lausanne, Switzerland, during summer period 2007.
http://www.artist-embedded.org/artist/EPSD-2007.html

FOSAD 2007
September 9-15, 2007 Bertinoro, Italy
The International School on Foundations of Security Analysis and Design (FOSAD) has been one of the foremost events established with the goal of disseminating knowledge in this critical area. The main aim of the FOSAD school is to offer a good spectrum of current research in foundations of security - ranging from programming languages to analysis of protocols, from cryptographic algorithms to access control policies and trust management - that can be of help for graduate students and young researchers from academia or industry that intend to approach the field.
http://www.artist-embedded.org/artist/FOSAD,877.html

4. Organisation of Workshops

These are all world-class events, featuring top speakers. See the links provided for details. As a rule, we always the slides and other pertinent materials available to the general public, via the Artist web portal.

The plans for Year4 are not exhaustive, since planning and organising workshops for Spreading Excellence is a continuous activity.

4.1 Directly Organized and Funded by Artist2 in Year3

In Year 3, Artist2 has directly organized and funded the following workshops.

FCC 2007
July 4-5, 2007 Venice, Italy
3rd Workshop on Formal and Computational Cryptography
http://www.artist-embedded.org/artist/Objectives-and-Scope,966.html

ARTIST WS: Tool Platforms for ES Modelling, Analysis and Validation
July 1-2, 2007 Berlin, Germany (satellite event of CAV 2007)
http://www.artist-embedded.org/artist/Aims-and-Scope.html

2nd Int'l ARTIST Workshop on Control for Embedded Systems
May 31st - June 1st 2007 U. of Illinois, Urbana-Champaign (USA)
The aim of the workshop is to gather key researchers within the control and real-time computing fields to chart the research agenda for the next decade in control for embedded systems.
http://www.artist-embedded.org/artist/Overview,917.html

Towards a Systematic Approach to Embedded System Design
April 20th, 2007 Acropolis Nice, France
European research is developing leading-edge tools. Industry has strong needs for design methods and tools. A system-oriented approach is the long-term objective.
http://www.artist-embedded.org/artist/ARTIST2-Workshop-at-Date-07.html

ARTIST2 Workshop on Basic Concepts in Mobile Embedded Systems
December 4-5, 2006 Vienna - Austria
It is the objective of this workshop to elaborate the basic concepts on mobile embedded systems based on existing approaches in distributed, real-time, and dependable systems.
http://www.artist-embedded.org/artist/Output-and-conclusions.html

ARTIST2 Workshop on Timing Analysis in the Industrial Development Process (ISoLA 2006)
November 17th, 2006 Paphos, Cyprus
1-day workshop. This Special Track will be concerned with questions around the integration of timing analysis in the industrial development process.
http://www.artist-embedded.org/artist/Isola-06.html

MoCC - Models of Computation and Communication
November 16-17, 2006 Zurich, Switzerland

Communication and cooperation between several disciplines: software and hardware but also computer science and engineering, real-time and distributed systems, telecommunication, control and signal processing.
http://www.artist-embedded.org/artist/MoCC-06.html

Artist2 - Foundations and Applications of Component-based Design
October 26th, 2006 Seoul, South Korea
The workshop gathered researchers from computer science and electrical engineering to discuss recent results on component-based design with emphasis on design frameworks for real-time systems encompassing heterogeneous composition and models of computation. Especially frameworks for handling non-functional and resource constraints, design under conflicting dependability criteria, trade-offs between average performance and predictability.
http://www.artist-embedded.org/artist/Overview,29.html

WESE'06 - Embedded Systems Education
October 26th, 2006 Seoul, Korea
This second workshop on the subject aims to bring researchers, educators, and industrial representatives together to assess needs and share design, research, and experiences in embedded systems education.
http://www.artist-embedded.org/artist/WESE-06.html

ATVA China 2006
October 23-26, 2006 Beijing, China
The purpose of ATVA is to promote research on theoretical and practical aspects of automated analysis, verification and synthesis in East Asia by providing a forum for interaction between the regional and the international research communities and industry in the field.
http://www.artist-embedded.org/artist/Objectives-and-Scope,873.html

ATVA China 2006
October 23-26, 2006 Beijing, China
The purpose of ATVA is to promote research on theoretical and practical aspects of automated analysis, verification and synthesis in East Asia by providing a forum for interaction between the regional and the international research communities and industry in the field.
http://www.artist-embedded.org/artist/Objectives-and-Scope,870.html

4.2 Partially Organized and Funded by Artist2 in Year3

In Year 3, Artist2 has partially organized and funded the following workshops.

UML&AADL'2007
July 14th, 2007 Auckland, New Zealand
This workshop seeks contributions from researchers and practitioners interested in all aspects of the representation, analysis, and implementation of DRE behaviour and/or architecture models.
http://www.artist-embedded.org/artist/Topics.html

WCET'07
July 3rd, 2007 Pisa, Italy
7th Int'l Workshop on Worst-Case Execution Time Analysis.
http://www.artist-embedded.org/artist/WCET-07.html

ARTIST WS: Tool Platforms for ES Modelling, Analysis and Validation
July 1-2, 2007 Berlin, Germany (satellite event of CAV 2007)
http://www.artist-embedded.org/artist/Aims-and-Scope.html

DCDS'07
June 13-15, 2007 Cachan (Paris), France
Fault-forecasting using fault-tree analysis, dependability modelling, fault-tolerant systems design, formal verification of control software, model-checking, fault detection and diagnosis of DES.
http://www.artist-embedded.org/artist/DCDS-07.html

Dagstuhl: Tools for the Model-based Development of Certifiable, Dependable Systems
June 10-15, 2007 Dagstuhl, Germany
Certification of dependable systems, developing and validating (semi-)formal methods and tools for modelling and verification.
http://www.artist-embedded.org/artist/Dagstuhl-Tools-for-the-Model-based.html

FMGALS'2007
May 29th, 2007 Nice, France
Third International Workshop on Formal Methods for Globally Asynchronous Locally Synchronous Design.
http://www.artist-embedded.org/artist/FMGALS-2007.html

SCOPES 2007
April 20th, 2007 Acropolis, Nice, France
SCOPES focuses on the software generation process for modern embedded systems. Topics of interest include all aspects of the compilation process, with emphasis on code generation techniques for embedded processors.
http://www.artist-embedded.org/artist/SCOPES-2007.html

IRTAW-13
April 17-19, 2007 Woodstock, Vermont, USA
13th International Real-Time Ada Workshop.
http://www.artist-embedded.org/artist/IRTAW-13.html

SLA++P 2007
March 31st, 2007 Braga, Portugal
Model-driven High-level Programming of Embedded Systems (formerly "Synchronous Languages, Applications, and Programming").
http://www.artist-embedded.org/artist/SLA-P-2007.html

WPDRTS 2007
March 26-27, 2007 Long Beach, California, USA
The International Workshop on Parallel and Distributed Real-Time Systems is a forum for the presentation and discussion of approaches, research findings, and experiences in the area of parallel and distributed real-time systems.
http://www.artist-embedded.org/artist/WPDRTS-2007.html

COCV 2007
March 25th, 2007 Braga, Portugal
Compiler Optimization Meets Compiler Verification *(6th International Workshop)*.
http://www.artist-embedded.org/artist/Overview,767.html

CASTNESS'07 Workshop and School
January 15-17, 2007 Rome, Italy
Computing Architectures and Software Tools for Numerical Embedded Scalable Systems.
http://www.artist-embedded.org/artist/CASTNESS-07-Workshop-and-School.html

Synchron 2006
November 27th - December 1st 2006 Alpe d'Huez, France
This workshop is devoted to all aspects of synchronous programming: languages, compiling techniques, formal methods, programming environments, execution platforms, semantics issues, code generation.
http://www.artist-embedded.org/artist/Synchron-06.html

JTRES 2006
October 11-13, 2006 Paris, France
Real-time and Embedded Java.
This workshop seeks to identify remaining challenging problems remaining to be solved, and to report results and experience gained by researchers.
http://www.artist-embedded.org/artist/JTRES-2006.html

MARTES 2006
October 2nd, 2006 Genova, Italy
This workshop gathers researchers and industrial practitioners to survey modeling and model-based analysis of distributed, real-time and embedded systems.
http://www.artist-embedded.org/artist/MARTES-2006,496.html

4.3 Plans for Year4: Workshops Directly Organized and Funded by Artist2

The following Artist2 workshops are planned for Year 4.

Between Control and Software (in honor of Paul Caspi)
September 28th, 2007 VERIMAG - Grenoble, France
This workshop, synchronized with the retirement of Paul Caspi in autumn 2007, will bring together experts in the field and collaborators of Paul at different periods for a series of lectures.
http://www.artist-embedded.org/artist/Between-Control-and-Software.html

Foundations of Component-based Design
September 30th, 2007 Salzburg, Austria - within EmSoft / ES Week
Discuss recent results on component-based design with emphasis on design frameworks for real-time systems encompassing heterogeneous composition and models of computation.
http://www.artist-embedded.org/artist/Foundations-of-Component-based.html

WESE'07: WS on Embedded Systems Education
October 4-5, 2007 Salzburg, Austria (within ES Week)
This third workshop on the subject aims to bring researchers, educators, and industrial representatives together to assess needs and share design, research, and experiences in embedded systems education.
http://www.artist-embedded.org/artist/WESE-07.html

ARTIST2 meeting on Integrated Modular Avionics
November 12-13, 2007 Roma, Italy
Integrated Modular Avionics (IMA) has set the principles of standardized components and interfaces of hardware and software in aircraft, applied for the first time in the development of the Airbus A380.
http://www.artist-embedded.org/artist/Integrated-Modular-Avionics.html

Synchron 2007
November 26-30, 2007 Bamberg, Germany
This workshop is devoted to all aspects of synchronous programming: languages, compiling techniques, formal methods, programming environments, execution platforms, semantics issues, code generation.
http://www.artist-embedded.org/artist/Overview,1125.html

5. Keynotes, Tutorials provided to the Embedded Systems Community

Artist2 partners have a very deep impact on the global embedded systems community, as is attested in the following direct contributions.

5.1 Real-Time Components

Workshop: MARTES 2006, Modelling and Analysis of Real Time and Embedded Systems; a satellite event of MoDELS/UML 20065, Int. Conf. on Model Driven Engineering Languages and Systems
Genova, Italy- October 2, 2006

VERIMAG and CEA have been the initiators of this workshop on model-driven development and real-time and embedded systems as a follow-up event on the successful workshop series on Real time embedded systems SIVOES and SVERTS. MARTES has been hold in October 2006 as a satellite event of the MODELS conference. The workshop attracted a number of interesting submissions and participants. The results of the workshop, as well as 2 best papers have been published in an LNCS volume.
http://www.martes.org/

Workshop : FMCO 2006, 5th Int. Symposium on Formal methods for Components and Objects
Amsterdam – November 7-10, 2006

The objective of this symposium is to bring together researchers and practioners in the areas of software engineering and formal methods to discuss the concepts of reusability and modifiability in component-based and object-oriented software systems. This symposium is a four days event organized to provide an atmosphere that fosters collaborative work, discussions and interaction. The program consists of keynote and tutorial presentations which are published in an LNCS Tutorial proceedings. VERIMAG is a co-organiser of this event
http://fmco.liacs.nl/fmco06.html

For 2007, we are preparing a special issue of this symposium bringing together groups of a set of related EU projects and NoEs; Artist is one of those groups.

Workshop : Towards a Systematic Approach to Embedded Design, a satellite event of
DATE 2007
Nice, France – April 20th, 2007

This workshop has been coorganised by KTH and VERIMAG as an interplatform meeting. The aim of this workshop was to increase awareness for potential industrial users about existing leading-edge academic embedded systems design tools. Results from several Artist platform activities and related external tools and challenges where presented..
http://www.artist-embedded.org/artist/Organisers.html

Workshop : Artist Workshop: Tool platforms for Embedded Systems Modelling, Analysis and Validation, a satellite workshop of
CAV 2007, Conference on Automated Verification
Berlin, Germany – July 1-2, 2007

This workshop has been coorganised by CEA, Aalborg University, KTH and VERIMAG as a follow-up of the interplatform meeting with DATE. The motivation for the workshop was the discussion of the specific problems raised in the context of embedded systems and the presentation of solutions from the perspective of design and development. The main aim was to intensify the cross fertilisation between the formal methods and the embedded systems communities. Results from several Artist platform activities and related external tools and challenges where presented.
http://www.artist-embedded.org/artist/Organisers.html

Workshop: Perspectives on integrating MDA and V&V (MoDeV2a'06)
MoDELS'2006
Pisa, Italy – October dates, 2006
The workshop has been organised by CEA, INRIA and University of Queensland (Australia) in conjunction with the MoDELS conference. V&V is an established area of research, and a transfer of ideas between V&V and MDA might help to improve quality and reliability of MDA and induce a new conceptual way of thinking in established V&V. So it is crucial to go beyond model-based testing and take a truly model-driven-development approach to V&V to reap even greater benefits.
http://modeva.itee.uq.edu.au

CAV 2007-19th International Conference on Computer Aided Verification
Berlin, Germany, July, 3-7, 2007
The 19th International Conference on Computer Aided Verification, CAV 2007, was held in Berlin from July 3-7, 2007, sponsored by – amongst others – the ARTIST2 NoE.
The CAV conference series is dedicated to the advancement of the theory and practice of computer-aided formal analysis methods for hardware and software systems. It covers the spectrum from theoretical results to concrete applications, with an emphasis on practical verification tools and the algorithms and techniques that are needed for their implementation. The proceedings of the conference are published in the Springer-Verlag Lecture Notes in Computer Science series.
On its tutorial day, CAV 2007 hosted 4 invited tutorials, by Tom Henzinger, EPFL (Switzerland), on *Modeling, Verification, and Synthesis of Component Interfaces,* Natarajan Shankar, SRI (USA), on *Satisfiability Modulo Theories,* Gary T. Leavnes, Iowa State University (USA), on the *Java Modelling Language*, and Martin Fränzle, CvO University Oldenburg (Germany), on *Verification of Hybrid Systems.* The main program of the conference featured 3 invited talks, by Byron Cook, Microsoft Research (UK), David Russinoff, AMD (USA) and Thomas Kropf, Robert Bosch AG (Germany), as well as talks about 33 regular papers and 14 tool presentations, carefully selected from a record number of 173 submissions.
CAV 2007 was accompanied by seven satelite events, several of them related to Artist or organized by or with the participation of Artist partners
http://cav2007.org/

Workshop Modeling and Safety Standards - How to Get it Right
SafeTronic 2006:
Munich, Germany, November 14, 2006.

Speakers: Hardi Hungar (OFFIS), Oliver Plan (Berner&Mattner Systemtechnik), Almuth-Ines Spiess (TÜV Süd Rail). A one-day tutorial has been held at the SafeTronic 2006 explaining how to use UML in the development of safety-critical (rail) systems by employing the language Safe-UML. There were about 25 participants, mostly from industry. It was demonstrated how the requirements layed down in domain-specific standards (here: the CENELEC standards EN 50126 and 50128, which have been derived from the more general IEC 61508) can be met in a development using UML. Adhering to the restriction of Safe-UML was shown as a key ingredient in this process.

Seminar on "Tools for the model-based development of certifiable, dependable systems"
Dagstuhl, Germany, 10.06.-15.06.2007

Transportation is an important application field of embedded systems. In this domain, the design of systems faces the challenge of not only producing a system which performs its function correctly, timely and reliably, but also of documenting to authorities that this is the case, if the system's is of safety-critical nature. This requirement has strong impact on the design process, as there are domain-specific standards which need to be followed.

Though the current practice largely seems to achieve its goal - as can be seen in the low percentage of accidents being attributable to design flaws - there are strong arguments to look for improvements. On the one hand, the effort to achieve sufficient confidence is rather high. And on the other hand, formal methods seem to have matured to a state that even a mathematically rigorous proof might become achievable.

To do this constitutes a challenge for the formal methods community with many facets: Not only several sorts of formal arguments (concerning e.g. timing, function and fault probabilities, different design levels, software and hardware and so on) are called for, but also evidence for the trustworthiness will be required. If e.g. a model checker verifies a property, it either must itself be verified or produce a proof for its verdict which can be validated by other means. To this end, existing approaches will have to be extended and combined into coherent, comprehensive methodologies.

To discuss these questions, Hardi Hungar (OFFIS) together with Michaela Huhn (TU Braunschweig) and Doron Peled (Bar-Ilan Univ.) organised an international seminar in Dagstuhl (Seminar 07421, 10.06.-15.06.2007). Using a realistic case study (a level crossing) techniques, tools and approaches were discussed by the participants. Differences in approach and background – as both the scientific as well as the industrial world was represented – showed up, resulting in mutual learning and common conclusions to be documented in the forthcoming workshop proceedings.

Keynote : Reasoning about the Trends and Challenges of Engineering Design Automation
20th Int Conf on VLSI Design and 6th Int Conf on Embedded System Design
Bangalore, January 6-10, Bangalore, India

Alberto Sangiovanni Vincentelli gave a keynote talk.
http://vlsiconference.com/vlsi2008/sitemap.htm

Keynote :
FORTE 2007
Talinn, Estonia – June 26-29, 2007

Susanne Graf presented an extension of the BIP framework to hierarchical components allowing encapsulation. This extension will be applied in the context of modular verification of system designs.
http://cs.ttu.ee/FORTE07/

Tutorial: MARTE: A New Standard for Modeling and Analysis of Real-Time and Embedded Systems, 19th Euromicro Conference on Real-Time Systems (ECRTS 07)
Pisa*, Italy – July 3rd, 2007 (around 15 participants)*

Sébastien Gérard (CEA), Julio Medina (Cantabria University) and D. C. Petriu (Carleton University) - the purpose of this tutorial has been to introduce the participants to the issues of model-driven development of RT/E applications and present how to use MARTE, the new OMG standard for dealing with model-driven development of RT/E applications. Considering the expertise of the audience in schedulability and performance analysis, special attention was made on the descriuption of the MARTE analysis capabilities.

http://feanor.sssup.it/ecrts07/tutorial.shtml

Tutorial: UML Tutorial: MARTE
Forum on specification & Design Languages (FDL'07)
Barcelona, Spain – September 20, 2007 (around 40 participants)

Sébastien Gérard (CEA) with the participation of Julio Médina (CEA & University of Cantabria), - the purpose of this tutorial is then to introduce the participants to the issues of model-driven development of RT/E applications and present how to use the new OMG standard for dealing with model-driven development of RT/E applications. FDL being a conference gathering mainly people work on research areas related to Hardware, this tutorial attempted to put a particular focus on this feature of the MARTE standard.
http://www.ecsi-association.org/ecsi/fdl/fdl07/

Keynote: A new standard unified language for real-time and embedded systems
Forum on specification & Design Languages (FDL'07)
Barcelona, Spain – September 20, 2007 (around 100 participants)

Laurent Rioux (Thales) - MARTE (A UML Profile for Modelling and Analysis of Real-Time and Embedded systems) is a new UML profile extension for real-time and embedded systems, which has been standardized in mid 2007 by the OMG (Object Management Group). This standard has been proposed by the “ProMarte” consortium, which consists of OMG end-users, tool providers and academics. MARTE defines concepts in terms of UML extensions needed to model and analyze real-time and embedded systems (RT/ES). MARTE bring solutions for specifying both software (middleware) and hardware platform resources, MDA compliance for separate description of the platform and the application to be allocated on it, and modelling of all kinds of non-functional properties (NFPs) such as time, but also power consumption or memory size. How MARTE is related to other standards like SysML, UML profile for QoS and UML 2? How MARTE can be specialized to address specific embedded domain as SystemC, SoC or AADL? How MARTE meet MDA approach for real-time and embedded systems?
http://www.ecsi-association.org/ecsi/fdl/fdl07/

Workshop: SYNCHRON’06
L’Alpe d’Huez, France: November 27th – December 1st, 2006.

This workshop is devoted to all aspects of synchronous programming: languages, compiling techniques, formal methods, programming environments, execution platforms, semantics issues, code generation... This year was the occasion of recalling the career and the achievemens of Paul Caspi for his retirement in 2007.

http://www.artist-embedded.org/artist/Synchron-06.html

Workshop: ARTIST2 Workshop on Basic Concepts in Mobile Embedded Systems
Vienna, Austria: December 4-5th, 2006.

Recent advantages in mobile and wireless technology have enabled a field of mobile embedded systems in new domains like pervasive computing but also in traditional domains like automation and process control. Thus, the time has come to integrate existing knowledge in the field of real-time systems, dependable systems, modelling and component design into the paradigm of mobile embedded systems. For example, this subject requires novel models of naming and addressing of the employed devices. While in static, wire-bound system, the address and route to a particular device implicitly identifies the device's function, in the mobile computing paradigm a particular device may appear on different routes in the network and take different roles as it moves in space and therefore interact with a another part of the environment. Moreover, when considering faults, a faulty node may also infiltrate multiple clusters. This has to be considered in the fault hypothesis for mobile embedded systems. Therefore, we need to extend existing models from the domain of real-time and distributed systems for mobile embedded systems that take into account naming, addressing, security, configuration, and dependability. The objective of this workshop was to elaborate the basic concepts on mobile embedded systems based on existing approaches in distributed, real-time, and dependable systems. The workshop has also mediated basic concepts of related fields like distributed systems and real-time systems to the mobile and wireless domains.

http://www.artist-embedded.org/artist/Objectives,679.html

Workshop: FMGALS'07
MEMOCODE'07
Nice, France: – May 29th, 2007

The ever increasing clock speed coupled with the ever decreasing engraving size of synchronous circuits raise taunting clock distribution and power leakage problems. For this reason, the Globally Asynchronous Locally Synchronous (GALS) model of computation has emerged as the paradigm of choice for SoC design with multiple timing domains, as well as for the software embedded on such circuits. Due to the inherent subtleties of asynchronous circuit design, formal methods are vital to make the GALS paradigm a success in the CAD industry. The FMGALS workshop aims at bringing together researchers from different communities interested in GALS design, and in applying formal methods in creating CAD tools enabling correct by construction GALS design.

http://www.artist-embedded.org/artist/FMGALS-2007.html

Symposium: CBSE07

The 10th International ACM SIGSOFT Symposium on Component-Based Software Engineering - Global Software Services and Architecture

Boston, July 9 - 11, 2007

The CBSE symposium has a track record of bringing together researchers and practitioners from a variety of disciplines to promote a better understanding of CBSE from a diversity of perspectives, and to engage in active discussion and debate. The symposium addresses participants from both universities and industry. The scope of the symposium includes (i) the theoretical foundations of component specification, composition, analysis and verification continue to pose research challenges. While the engineering models and methods for component software development are slowly maturing, new trends in global services and distributed systems architectures push the limits of established and tested component-based methods, tools and platforms (ii) model-driven development and grid technologies with their high-performance demands in massive data storage, computational complexity and global co-scheduling of scientific models in flagship science, technology and medicine research; (iii) global software development with its lowering of cost of software capabilities and production, through automation, off-shoring and outsourcing of key components and subsystems; (iv) networked enterprise information systems and services architectures crossing enterprise, nation, legal and discipline boundaries; (v) shift from (globally distributed) software products to pervasive and ubiquitous services supported by deep software-intensive infrastructures and middleware and by increasingly flexible, adaptive and autonomous client and application server software.

Tutorial: Evaluating Dependability Attributes of Component-Based Specifications at Internatonal Conference on Software Engineering (ICSE 2007)

Ivica Crnkovic, MDH and Lars Grunske

20 May 2007, Full Day Tutorial

Summary: Component-Based Development (CBD) and more specifically Component-based Software Engineering (CBSE) are established in many application domains. There is strong trend in applying the same approach in different domains of dependable systems, in particular safety-, mission- or business-critical systems. However, a precondition of a successful application of CBD in these domains is the existence of theories, methods and technologies to predict and evaluate dependability attributes such as safety, reliability, availability, maintainability, performance, security and temporal correctness, based on component-based specifications. The experience has shown that this is not a trivial task, since most of CBD technologies do not have built-in support for dependability. This tutorial gives an analysis of current methodologies of attribute-specific evaluation methods for dependable component-based systems; we identify limitations of the current technologies and discuss existing and possible new solutions to overcome these limitations both from a research-oriented and practical perspective. The tutorial is aimed for researchers and practitioners either working with CBD or dependability, or who are interested in getting deeper insights in these areas.

Tutorial: Emerging Technologies in Industrial Context: Component-Based and Service-Based Software Engineering at COMPSAC 2007-09-11

Ivica Crnkovic,MDH, and Honyu Pei-Breivold

27 July, 2007

Component-based software engineering (CBSE) and service-oriented software engineering (SOSE) are two similar but distinguished approaches in software engineering. In this tutorial, we compare CBSE and SOSE and analyze them from different perspectives. We discuss the possibility of combining the strengths of the two paradigms.

Tutorial : Modeling, Verification, and Synthesis of Component Interfaces
19th International Conference on Computer-Aided Verification (CAV),
Berlin, Germany- July 3-7, 2007

Invited tutorial by Tom Henzinger, EPFL
http://www.cav2007.org/

Invited Lecture : The Embedded Systems Design Challenge
12th International Workshop on Formal Methods for Industrial-Critical Systems (FMICS), *Berlin, Germany- July 2007*
Invited lecture by Tom Henzinger, EPFL
http://fmics07.lcc.uma.es/

Invited Lecture : The Embedded Systems Design Challenge
14th International Symposium on Formal Methods (FM)
Hamilton, Ontario, August 2006
Invited lecture by Tom Henzinger, EPFL
http://fm06.mcmaster.ca/

Invited Lecture: Tackling Heterogeneity in Embedded (Software) Systems Development
EU-US workshop on Wireless Networked Embedded Systems
Edinburgh, July 10, 2007
Invited lecture by François Terrier, CEA LIST
http://euusworkshop07.specknet.org

Keynote Speech: Real Time Communication - What Are the Real Issues?
SNART Real-Time in Sweden Conference (RTiS)
Västerås, Sweden, August 21-22, 2007
Invited talk by Hermann Kopetz, TU Vienna
http://www.idt.mdh.se/RTiS2007/

Keynote Talk: Embedded System Development for Automotive Applications: Trends and Challenges
EMSOFT 2006
Seoul, South Korea – October 22-25, 2006
Invited talk by Werner Damm, OFFIS
http://www.emsoft.org/

Key Note Speech: Reasoning about the Trends and Challenges of Engineering Design Automation
20th International Conference on VLSI Design and 6th International Conference on Embedded System Design, Bangalore, January 6-10,2007, Bangalore, India
Invited talk by Alberto Sangiovanni-Vincentelli

Tutorial: Clock Synchronization and Determinism, Fault Tolerance, and System Design
ARTES Summer School
Västerås, Sweden, August 20-24, 2007
Invited tutorial by Hermann Kopetz, TU Vienna
http://www.artes.uu.se/events/summer07/

5.2 Adaptive Real-Time

1. "QoS-Based Resource Management"
   given by Marisol García Valls
   University of Thessaloniki, Greece
   May 5th, 2007.

2. “Predictable response times in event-driven real-time systems”
   M. González Harbour
   Automotive 2006 - Security and Reliability in Automotive Systems, Stuttgart
   October, 2006.

3. L. Almeida. Traffic Scheduling Anomalies within Temporal Partitions. Invited Lecture at the Computer Science Departament, University of Pennsylvania, Philadelphia, USA, de 14 de Novembro de 2006.

4. L. Almeida. Brief Tour of Real-Time Embedded Networks. Lecture within the Real-Time Systems Course, Computer Science Departament, University of Pennsylvania, Philadelphia, USA, de 14 de Novembro de 2006.

5. L. Lo Bello, “Open Research Issues in Real-Time Networks”, WIRTES 2007, First Italian Workshop on Real-Time and Embedded Systems, July 2nd, 2007, Pisa, Italy.

6. Pereira, N., "A Prioritized Collision-Free MAC Protocol for Wireless Medium", Carnegie Mellon University, Dec. 2006.

7. Andersson, B., "Real-Time Scheduling on Multiprocessors", Carnegie-Mellon University, Feb. 2007.

8. Andersson, B. "Integration of WiDom in Real-Time Chains", University of Illinois Urbana Champaign, Mar. 2007.

9. Andersson, B., Tovar, E., "Computing Aggregated Quantities Efficiently in Large-Scale Dense Sensor Networks", EU-US Workshop on Wirelessly Networked Embedded Systems Cyber-Physical Systems and Beyond, Edinburgh, UK, July 2007.

10. Dynamic CAN Priorities
    Speaker: Josep M. Fuertes
    In "CANopen - Applications and markets", July 2, UPC, Barcelona, Spain 2007
    http://www.can-cia.org/dates/events/?278

11. Operating Systems, V&V Practical Aspectws, Real-Time Control
    Speaker: Josep M. Fuertes
    In Professional short course on "Critical software quality assurance: aerospace and industrial applications", 15 to 20 February 2007 in Barcelona, Spain
    http://www.ctae.org/downloads/criticalswcourse.pdf

Workshop: First Italian Workshop on Real-Time Embedded Systems
RETIS Lab, Scuola Superiore Sant’Anna, Pisa
July 2, 2007
Organizers: Giorgio Buttazzo, Giuseppe Lipari, Lucia Lo Bello

Objectives: Build an Italian community on real-time embedded systems and favor interactions between Italian industry and academic researchers.
Topics: real-time scheduling, operating systems, sensor networks, design methodologies
Results: The workshop attracted 16 universities and 12 industries working in the field, 28 short presentations were given and participants had time to meet, know each other and exchange information on their research interests. A second workshop is planned for next year.
URL: http://feanor.sssup.it/wirtes07/

Workshop: WCET 2007: Worst Case Execution Time Analysis
RETIS Lab, Scuola Superiore Sant'Anna, Pisa
July 3, 2007
Organizers: Christine Rochange, TRACES group, IRIT, Toulouse, France
Objectives: Bring together people from academia, tool vendors and users in industry that are interested in all aspects of timing analysis for real-time systems.
Topics: Timing analysis, calculation methods for WCET, testing methods for WCET analysis, tools for timing analysis, compiler optimizations for worst-case paths.
Results: The workshop attracted 32 participants from different European countries and technical papers have been published in proceedings.
URL: http://www.irit.fr/wcet2007/

Workshop: RTN 2007: Real-Time Networks
RETIS Lab, Scuola Superiore Sant'Anna, Pisa
July 3, 2007
Organizers: Ye-Qiong Song, LORIA, Nancy, France
Objectives: RTN focuses on the current technological challenges of developing communication infrastructures that are real-time, reliable, pervasive and interoperable.
Topics: Distributed systems, communication protocols, wireless sensor networks, mobile ad-hoc networks.
Results: The workshop attracted 30 participants from different European countries and technical papers have been published in proceedings.
URL: http://rtn2007.loria.fr/

Workshop: OSPERT 2007: Operating Systems Platforms for Embedded Real-Time Applications
RETIS Lab, Scuola Superiore Sant'Anna, Pisa
July 3, 2007
Organizers: Scott A. Brandt, University of California, Santa Cruz, CA, USA and Kevin Elphinstone, University of New South Wales, Kensington, NSW, Australia.
Objectives: This workshop is intended as a forum for researchers and practitioners of RTOS to discuss the recent advances in RTOS technology and the challenges that lie ahead.
Topics: Support for component based development; Scalability, from very small scale embedded systems to full-fledged OSes; Real-Time on Linux; Interaction with reconfigurable hardware; Support for embedded multi-processor architectures; Security and fault tolerance for embedded real-time systems; Power-aware operating systems..
Results: The workshop attracted 18 participants from different European countries and technical papers have been published in proceedings.
URL: http://www.cs.ucsc.edu/~sbrandt/OSPERT.html

Workshop: X Jornadas de Tiempo Real 2007
Organized by UPC, Barcelona, Spain
Spanish forum for real-time researches
URL: http://congress.cimne.upc.es/JTR2007/

Workshop: International Workshop on Models of Computation and Communication
MoCC, Zurich
November, 2006.

Workshop: NeRES 2007 - ARTIST2 Workshop on Networks for Reconfigurable Embedded Systems
Aveiro, Portugal
April 2007.
Targeted dicussing the network requirements to support reconfigurability in distributed embedded systems, as well as the adequacy of current protocols and middlewares. URL: http://www.artist-embedded.org/artist/Motivation-and-Goal.html

Tutorial: "MARTE: A New Standard for Modeling and Analysis of Real-Time and Embedded Systems"
RETIS Lab, Scuola Superiore Sant'Anna, Pisa
July 3, 2007
URL: http://feanor.sssup.it/ecrts07/tutorial.shtml

Course: "Networked and embedded control systems" in the 2nd HYCON PhD School on Hybrid Systems (http://www.dii.unisi.it/hybrid/school07/), organized by the European Network of Excellence "HYCON - Hybrid Control: Taming Heterogeneity and Complexity of Networked Embedded Systems <http://www.ist-hycon.org>" (6th Framework program).

Course: L. Almeida, Real-Time Networks for Embedded Control Systems, 1st European South American School on Embedded Systems, Buenos Aires, Argentina, 8 hours lecture, 21 to 24 August 2007.

Course: L. Almeida, Real-Time Networks for Distributed Embedded Systems, University of Pisa, Italy, 8 hours lecture and 4 hours laboratory, 2 to 4 May 2007.

Course: L. Almeida. A Holistic View at the Real-Time Issues within Robotic Soccer. Seminar at the Universidad Nacional del Sur, Bahia Blanca, Argentina, 17 August 2007.

Course: L. Almeida. A Holistic View at the Real-Time Issues within Robotic Soccer. Seminar at the Zhejiang University, Hangzhou, China, 28 June 2007.

Course: L. Almeida. CAN and the challenge of designing Safety-critical automotive systems. Seminar at the Linköping University, Linköping, Sweden, 11 June 2007.

Course: L. Almeida. Towards Flexible Distributed Computer Control Systems. Seminar at the Halmstad University, Halmstad, Sweden, 14 May 2007.

Course: L. Almeida. Designing Distributed Real-time Systems: a Focus on Holistic Time-Triggered Design. Lecture within the Real-Time Systems Course, Computer Science Departament, University of Pennsylvania, Philadelphia, USA, de 28 de Novembro de 2006.

Competition: L. Almeida, N. Lau, P. Pedreiras and A. Pereira. CyberMouse@RTSS2006, Rio de Janeiro, Brazil, Dec 2006. Students design competition within the scope of RTSS 2006. Similar to a satellite workshop but targetting students and where students have to develop the control software for a small robot and run it against the other teams. http://www.ieeta.pt/~lau/web_ciberRTSS/

Contribution to Standards: POSIX

The University of Cantabria (UC) has continued participation in the POSIX standard. There is currently a new revision of the standard being produced with technical corrigenda, and the UC participates in the debate and ballot process. Initial steps have been taken in the Real-Time System Services Working Group to start a revision of the POSIX.13 standard that defines the real-time profiles. The UC is also participating in the revision of the POSIX-Ada bindings, which is a project that is just starting.

Contribution to Standards : OMG–MARTE

In this period we continue working in the technical activities of the OMG, attending the Technical Meeting in San Diego from 26 to 30 March 2007, and sending a preliminary submission in response to the UML Profile for Modeling and Analysis of Real-Time and Embedded systems (MARTE) request for proposals. The submission was presented to the RTESS (Real-Time Embedded and Specialized Systems) Platform Task Force and was very well received. The standard has now been approved.

UC will continue to work in the Finalization Task Force of the UML Profile for Modeling and Analysis of Real-Time and Embedded systems (MARTE), in order to solve the issues that may be raised by the industrial community about MARTE, and ensure its applicability in the modeling of platforms that can deal with flexible scheduling technologies.

Tutorial: MARTE: A New Standard for Modelling and Analysis of Real-Time and Embedded Systems ,
19th Euromicro Conference on Real-Time Systems (ECRTS 07),
Pisa, Italy, July 3rd, 2007.

This Conference is a forum aimed at covering state-of-the-art research and development in real-time computing. Papers on all aspects of real-time systems are presented. It is the largest real-time conference in Europe (http://feanor.sssup.it/ecrts07/)

Workshop: International workshop on UML & AADL'2007-09-20
(Held in conjunction with the 12th IEEE International Conference on Engineering Complex Computer Systems, ICECCS07)
Auckland, New Zealand. July 11 - 14, 2007

This workshop seeks contributions from researchers and practitioners interested in all aspects of the representation, analysis, and implementation of DRE behaviour and/or architecture models. The main interest topics were:

- Modelling RT/E using modelling languages such as UML and/or AADL, ACME…
- Defining a suitable architecture based process development
- Methods and tools for undertaking an MDA approach

Workshop: NeRES 2007 - Networks for Reconfigurable Embedded Systems (Artist2 workshop): http://www.artist-embedded.org/artist/Motivation-and-Goal.html

The workshop seeks flexible approaches to reconfigurability with the goal to improve resource efficiency, exploiting paradigms such as flexible modes, flexible scheduling, dynamic QoS management, stateful schedules, etc, particularly at the network level.

Workshop: Modelling and Analysis of Real-Time and Embedded Systems
(Held in conjunction with the ACM/IEEE 9th International Conference on Model Driven Engineering Languages and Systems, MODELS)
Genova, Italy, October 2, 2006

In the area of distributed, real-time and embedded systems (DRES), model-orientation has been applied fruitfully for many years. However, DRES have some very specific requirements. The purpose of this workshop is to provide an opportunity to gather researchers and industrial practitioners to survey existing efforts related to model-based design and analysis of DRES.

DRES have been designed in a model-oriented way since the forerunners of UML SDL and ROOM. The MDA initiative of OMG — for "Model Driven Architecture" – follows up by the idea that future process development will be centered on models, thus keeping application development, and underlying platform technology as separate as possible. The aspects influenced by the underlying platform technology concern mainly non-functional aspects and communication primitives.
http://www.artist-embedded.org/artist/MARTES-2006,496.html

Keynote: Predictable response times in event-driven real-time systems.

Automotive 2006 - Security and Reliability in Automotive Systems
Stuttgart, October, 2006

M. González Harbour

Keynote: QoS-Based Resource Management
University of Thessaloniki
Thessaloniki*, Greece– May 4th, 2007*

The keynote talk was given in the context of a periodic departamental workshop open to researchers and university students.

The topic of the talk was resource management in embedded applications that are tolerant to some degree of flexibility and, therefore, admit QoS-based operation. The talk introduced the problems of these systems and the solutions ranging from the older contract-based approach, to centralised resource management, to distributed resource management, and higher level protocols for managing application execution.

Marisol Garcia Vals

Workshop NeRES 2007 – Networks for Reconfigurable Embedded Systems
Aveiro, Portugal – April 2007

This workshop was organized in the scope of the activity Dynamic and Pervasive Networks (appears in more detail in that report) and it targeted discussing the network requirements to support reconfigurability in distributed embedded systems, as well as the adequacy of current protocols and middlewares for that purpose,. Several presentations were delivered focusing on middleware layers to support flexible resource management, which was one kind of reconfiguration that was addressed.
URL: http://www.artist-embedded.org/artist/Motivation-and-Goal.html

First Italian Workshop on Real-Time Embedded Systems
RETIS Lab, Scuola Superiore Sant'Anna, Pisa, July 2, 2007

Organizers: Giorgio Buttazzo, Giuseppe Lipari, Lucia Lo Bello
Objectives: Build an Italian community on real-time embedded systems and favor interactions between Italian industry and academic researchers.
Topics: real-time scheduling, operating systems, sensor networks, design methodologies
Results: The workshop attracted 16 universities and 12 industries working in the field, 28 short presentations were given and participants had time to meet, know each other and exchange information on their research interests. A second workshop is planned for next year.
URL: http://feanor.sssup.it/wirtes07/

WCET 2007: Worst Case Execution Time Analysis
RETIS Lab, Scuola Superiore Sant'Anna, Pisa, July 3, 2007

Organizers: Christine Rochange, TRACES group, IRIT, Toulouse, France
Objectives: Bring together people from academia, tool vendors and users in industry that are interested in all aspects of timing analysis for real-time systems.
Topics: Timing analysis, calculation methods for WCET, testing methods for WCET analysis, tools for timing analysis, compiler optimizations for worst-case paths.
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July 3, 2007
URL: http://feanor.sssup.it/ecrts07/tutorial.shtml

13th International Real-Time Ada Workshop - IRTAW
Woodstock, Vermont, USA, 17th-19th April 2007.

Full session summaries and workshop papers are available on the ARTIST2 web site, see http://www.artist-embedded.org/artist/IRTAW-13.html .

4th Java Technology for Real-Time and Embedded Systems - JTRES
Conservatoire National des Arts et Métiers (CNAM), Paris, France, Oct 2007.

See http://www-users.cs.york.ac.uk/~andy/JTRES06 for details of the event and its papers.

Invited Talk: Andersson, B., Tovar, E., "Computing Aggregated Quantities Efficiently in Large-Scale Dense Sensor Networks", EU-US Workshop on Wirelessly Networked Embedded Systems Cyber-Physical Systems and Beyond, Edinburgh, UK, Jul. 2007. (available at http://euusworkshop07.specknet.org/Programme).

Invited Talk: L. Lo Bello, "Open Research Issues in Real-Time Networks", WIRTES 2007, First Italian Workshop on Real-Time and Embedded Systems, July 2nd, 2007, Pisa, Italy. (available at: http://feanor.sssup.it/wirtes07/slides/session1/lobello.pdf)

Invited Talk: Pereira, N., "A Prioritized Collision-Free MAC Protocol for Wireless Medium", Carnegie Mellon University, Dec. 2006.

Invited Talk: Andersson, B. "Integration of WiDom in Real-Time Chains", University of Illinois Urbana Champaign, Mar. 2007.

Workshop: NeRES 2007 – Networks for Reconfigurable Embedded Systems
Aveiro, Portugal – April 2007

This workshop was targeted to discuss the network requirements for supporting reconfigurability in distributed embedded systems, as well as the adequacy of current protocols and middlewares for that purpose. It gathered 26 participants from 15 institutions in 6 countries, with one industrial representative and several other academic participants presenting industrial case studies. There were 13 presentations covering aspects that ranged from flexible middleware, namely based on components, on resource contracts, on services and on the support for flexible scheduling, to dependability, integration, wireless mobile ad-hoc communication, intelligent telecommunication networks, industrial automation, automatic control systems, automotive and avionic systems.
http://www.artist-embedded.org/artist/Motivation-and-Goal.html

Tutorial: Real-Time Networks for Embedded Control Systems
Conference: 1st European South American School on Embedded Systems
Lecturer: Luis Almeida
Buenos Aires, Argentina – August 21 to 24, 2007

This tutorial was a module of the referred summer school, with 8 hours of lecturing focusing on the concepts, techniques, technologies and applications of networking for embedded control applications.
http://www.artist-embedded.org/artist/Objectives.html

Tutorial: Real-Time Networks for Distributed Embedded Systems
Lecturer: Luis Almeida
Pisa, Italy – May 2 to 4, 2007
Short course on the referred topic with 8 hours of lecturing and 4h labs.

Seminar: CAN and the challenge of designing Safety-critical automotive systems
Lecturer: Luis Almeida
Linkoping, Sweden – June 11, 2007

Seminar given at the Linkoping University

Seminar: Towards Flexible Distributed Computer Control Systems
Lecturer: Luis Almeida
Halmstad, Sweden – May 14, 2007
Seminar given at the Halmstad University

Tutorial: Designing Distributed Real-time Systems: a Focus on Holistic Time-Triggered Design
Lecturer: Luis Almeida
Philadelphia, USA – November 28, 2006
Lecture within the Real-Time Systems Course, Computer Science Departament, University of Pennsylvania, Philadelphia,
http://www.cis.upenn.edu/~lee/06cse480/lec-drts.pdf

Seminar: Traffic Scheduling Anomalies within Temporal Partitions
Lecturer: Luis Almeida
Philadelphia, USA – November 14, 2006
Invited Lecture at the Computer Science Departament, University of Pennsylvania, Philadelphia,
http://www.cis.upenn.edu/departmental/events/abstracts-2005/Luis.html

Tutorial: Brief Tour of Real-Time Embedded Networks
Lecturer: Luis Almeida
Philadelphia, USA – November 14, 2006
Lecture within the Real-Time Systems Course, Computer Science Departament, University of Pennsylvania, Philadelphia,
http://www.cis.upenn.edu/~lee/06cse480/lec-holistic-scheduling.pdf

5.3 Compilers and Timing Analysis

Cluster partners have been very active in the dissemination of results.

Workshop: Reinhard Wilhelm: Timing Predictability - A Must for Avionics Systems

Conference name National Workshop on Aviation Software Systems: Design for Certifiably Dependable Systems, A Workshop on Research Directions and State of Practice of High Confidence Software Systems, October 4-5, 2006, Alexandria, VA, USA.

This workshop was sponsored to bring together the Practice Community with the Research Community in avionics to define the Intellectual Agenda in Software for Critical Aviation Systems. The goals, among others, include:

- Define Current State of the Art
- Identify Key Issues and Needs
- Identify Promising Research Approaches
- Define Educational Needs and Approaches

http://chess.eecs.berkeley.edu/hcssas/

Tutorial: Reinhard Wilhelm: Timing Analysis
MOTIVES ARTIST2 Winter School, Trento, Italy, February 19-23 2007, organized by Kim Guldstrand Larsen, Bengt Jonsson, Reinhard Wilhelm.

This 5-day winter school was for young researchers working or wanting to work in modelling, validation, synthesis and performance analysis of embedded systems, as well as engineers from industry with a practical background in design, control and testing of embedded systems.
http://www.artist-embedded.org/artist/Overview,577.html

Workshop: Reinhard Wilhelm: Design for Timing Predictability

Conference name: Dagstuhl Seminar on Quantitative Aspects of Embedded Systems, Schloss Dagstuhl, 04.03.07 - 09.03.07

Organizers: Boudewijn Haverkort (University of Twente, NL), Joost-Pieter Katoen (RWTH Aachen, D), Lothar Thiele (ETH Zürich, CH)

Despite the importance of the quantitative constraints for the well-operation of embedded systems, the proper assessment of cost, resources, performance, dependability, robustness, etc., often comes as an afterthought. It is rather common for embedded software to be fully designed and functionally tested before any attempt is undertaken to determine its performance, dependability or resource-usage characteristics. One of the main reasons for this situation is that well-developed and rigorous evaluation techniques for non-functional, i.e., quantitative system aspects have not become an integral part of standard software engineering practice. This undesirable situation has led to the increased interest by embedded software researchers to extend the usual functional specification and properties with a set of “performance indices", e.g., stated in terms of costs, timeliness, speed and the like, and constraints on these indices. Also in industry, a growing interest in assessing non-functional aspects of embedded systems as early as possible in the system design life cycle can be witnessed.
http://www.dagstuhl.de/en/program/calendar/semhp/?semnr=2007101

Workshop: Software & Compilers for Embedded Systems (SCOPES) 2007
Nice, France – April 20, 2007

The influence of embedded systems is constantly growing. Increasingly powerful and versatile devices are developed and put on the market at a fast pace. The number of features is increasing, and so are the constraints on the systems concerning size, performance, energy dissipation and timing predictability. Since most systems today use a processor to execute an application program rather than using dedicated hardware, the requirements can not be fulfilled by hardware architects alone: Hardware and software have to work together to meet the tight constraints put on modern devices.

One of the key characteristics of embedded software is that it heavily depends on the underlying hardware. The reason of the dependency is that embedded software needs to be designed in an application specific way. To reduce the system design cost, e.g. code size, energy consumption etc., embedded software needs to be optimized exploiting the characteristics of the underlying hardware.

SCOPES focuses on the software generation process for modern embedded systems. Topics of interest include all aspects of the compilation process, starting with suitable modeling and specification techniques and programming languages for embedded systems. The emphasis of the workshop lies on code generation techniques for embedded processors. The exploitation of specialized instruction set characteristics is as important as the development of new optimizations for embedded application domains. Cost criteria for the entire code generation and optimization process include runtime, timing predictability, energy dissipation, code size and others. Since today's embedded devices frequently consist of a multi-processor system-on-chip, the scope of this workshop is not limited to single-processor systems but particularly covers compilation techniques for MPSoC architectures.

In addition, this workshop intends to put a spotlight on the interactions between compilers and other components in the embedded system design process. This includes compiler support for e.g. architecture exploration during HW/SW codesign or interactions between operating systems and compilation techniques. Finally, techniques for compiler aided profiling, measurement, debugging and validation of embedded software are also covered by this workshop, because stability of embedded software is mandatory.

SCOPES 2007 is the 10th workshop in a series of workshops initially called "International Workshop on Code Generation for Embedded Processors". The name SCOPES has been used since the 4th workshop. The scope of the workshop remains software for embedded systems with emphasis on code generation (compilers) for embedded processors.

SCOPES 2007 was organized by Heiko Falk and Peter Marwedel from Dortmund University and was held as DATE Friday Workshop.

http://www.scopesconf.org/scopes-07/

Workshop : ACE Second Cosy Community Gathering (CCG'06)
Amsterdam, Netherlands – October 2006

This CoSy workshop was held to give the users of the CoSy system a platform to present their results and discuss their experiences. Amongst others, participants came from RWTH Aachen and Technical University of Berlin.

Workshop : CoSy Research Workshop
Amsterdam, Netherlands – March 2007

A CoSy workshop was held for academic partners including Universities of Amsterdam, Cambridge, Aachen, Edinburgh, Twente, Dresden, Berlin.

Workshop : CoSy Research Workshop
Amsterdam, Netherlands – August/September 2007

A CoSy workshop was held for academic partners including Universities of Edinburgh, Delft, Berlin, Amsterdam, and Imperial College London, IMEC, INESC-ID, NTHU.

Workshop : Software & Compilers for Embedded Systems (SCOPES) 2007
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http://www.scopesconf.org/scopes-07/

Workshop : Compiler Optimization Meets Compiler Verification (COCV'07)
Braga, Portugal – 25 March 2007

COCV provides a forum for researchers and practitioners working on optimizing and verifying compilation, and on related fields such as translation validation, certifying compilation and embedded systems with a special emphasis on hardware verification, formal synthesis methods, correctness aspects in HW/SW co-design, formal verification of hardware/software systems, and practical and industrial applications of formal techniques for exchanging their latest findings, and for plumbing the mutual impact of these fields on each other. By encouraging discussions and co-operations across different, yet related fields, the workshop strives for bridging the gap between the communities, and for stimulating synergies and cross-fertilizations among them.

COCV'07 is the 6th workshop in a series of workshops held annually since 2002. COCV'07 was organized by Sabine Glesner (TU Berlin), Jens Knoop (TU Vienna) and Rolf Drechsler (University of Bremen) and was held as a satellite event of ETAPS'07.

http://pes.cs.tu-berlin.de/cocv2007/

Exhibition : OpenCoSy Stand
Design, Automation and Test in Europe (DATE)
Nice, France – 16-20 April

Aachen presented the results of its research at DATE in Nice. A specially organised OpenCoSy stand for academic users of CoSy – www.opencosy.org/announcements. This stand proved very attractive to attendees over the course of the week wth the results obtaining an unusually high level of visibility for such projects. Also represented on the stand were University of Amsterdam, TU Delft, Leiden University and Edinburgh University.

Workshop : Dagstuhl Seminar 08161 "Scalable Program Analysis"
Schloss Dagstuhl, Germany – 13.04.08 – 18.04.08.

Organizers: Florian Martin (AbsInt), Hanne Riis Nielson (Technical University of Denmark), Claudio Riva (NOKIA Research Center - Helsinki), Markus Schordan (TU Vienna).

The application for the seminar has been accepted in 2007.
http://www.dagstuhl.de/de/programm/kalender/semhp/?semnr=2008161/

5.4 Execution Platforms

Workshop: Workshop on Models and Analysis for Automotive Systems
Real-Time Systems Symposium (RTSS)
December 5, 2006

TU Braunschweig participated with a talk on "The Need of a Timing Model for the AUTOSAR Software Standard".

Special Session: Virtual Automotive Platforms
Design Automation Conference (DAC)
June 6, 2007

TU Braunschweig was invited to participate in the special session on "Virtual Automotive Platforms" at the renowned Design Automation Conference (DAC). The talk "Automotive Software Integration" showed how formal techniques can be applied to solve performance related integration problems in the design process of complex modern automotive systems.

Tutorial: Extensible Frameworks for System-Level Analysis of Real-Time Systems
Real-Time and Embedded Technology and Applications Symposium (RTAS)
Aprl 4, 2006

TU Braunschweig has organized together with ETH Zürich and University of Notre Dame the tutorial "Extensible Frameworks for System-Level Analysis of Real-Time Systems" at the Real-Time and Embedded Technology and Applications Symposium (RTAS).

Lecture: Supporting Predictable Design Using Formal Analysis Techniques
ARTES Summerschool
August 23, 2006

TU Braunschweig has given a lecture with the title "Supporting Predictable Design Using Formal Analysis Techniques" at the ARTES summerschool (A Network for Real-Time Research and Graduate Education in Sweden) that took place in Nässlingen, Sweden, August 23, 2006. The audience consisted of Phd Students from the field of real-time research, which allowed disseminating recent results in embedded system design to related research teams (mainly) in Scandinavia.

Workshop: Towards a Systematic Approach to Embedded System Design
DATE, Design, Automation, and Test in Europe
Nice, France – 20th April, 2007

DTU has given a talk at with the title "Formalizing the ARTS MPSoC Model in UPPAAL" at the ARTIST2 Workshop at the DATE conference. The target audience of the workshop was industry representatives and researchers wishing to interact about applications and needs for leading-edge Embedded Systems Design tools. The workshop was organized by ARTIST2.

Demo: MOVES, a Tool for Verification of MPSoC Systems
DATE, Design, Automation, and Test in Europe
Nice, France – 20th April, 2007

DTU has given a demo of their tool for modeling and verification of MPSoC systems at the DATE University Booth. In a 2 hour slot, the tool was presented and discussed with academic and industrial peopole participating in the DATE conference.

Seminar: Quantitative Aspects of Embedded System Design
Dagstuhl seminar
Dagstuhl, Germany – 4-9, Marts, 2007

DTU has given two talks at at the Dagstuhl seminar organized partly by ARTIST2. The two talks were "MOVES: A Tool for Modeling and Verification of Embedded Systems" and "Deciding an Interval Logic with Durations". The purpose of the seminar was to connect the results on performance analysis in ARTIST2 with the community dealing with statistical and stochastic methods. http://www.dagstuhl.de/de/programm/kalender/semhp/?semnr=2007101

Workshop: Tool Platforms for Embedded Modelling, Analysis and Validation
CAV, Computer Aided Verification Conference
Berlin, Germany – 1-2 July, 2007

DTU co-organized the ARTIST2 Workshop at CAV 2007. DTU and AAU gave a talk with the title "Validation og Performance Properties with Uppaaal and Applications". The main aim of the workshop was to intensify the cross fertilisation between the formal methods and the embedded systems communities. http://www.artist-embedded.org/artist/Aims-and-Scope.html

PhD-course: Automated Formal Methods for Embedded Systems
Lyngby, Denmark – 4-12 June, 2007

DTU has organized an ARTIST2 sponsored PhD course on "Advanced Topics in Embedded Systems", that took place at IMM, DTU, Lyngby, Denmark, June 4-12, 2007. Lectures were given by ARTIST memebers from Oldenburg, Germany, ETH Zurich, Switzerland, and Braunsweigh, Germany. The course had 17 participants of which 10 were PhD students from 7 different universitys spread over 4 different countries. The course were a big success and will be repeated in 2008. http://www.artist-embedded.org/artist/ARTIST2-PhD-Course-on-Automated.html

Lecture: Deciding an Interval Logic with Durations
Trust Soft PhD Seminar
Oldenburg, Germany - July, 2007

DTU has given a lecture with the title "Deciding an Interval Logic with Durations" at the Trust Soft Phd Seminar at Oldenburg.

Mini-keynote: Codesign
7th International Forum on Application-Specific Multi-Processor SoC (MPSoC)
Awaji Island, Japan – 25-29 June, 2007

DTU has been given a talk on "*If Fomal Analysis is the Answer – What was the Question? ".* The mini-keynote addressed the problem of verifying complex MPSoC systems using formal methods, in particular addressing the question of which propeties of such a system could be formally verified. It presented results from the collaboration between DTU and AAU where the ARTS system has been modeled in Uppaal. http://tima.imag.fr/mpsoc/

Workshop: MOVES, a Tool for Modeling and Verification of Embedded Systems
MoDES Workshop
Sønderborg, Danmark –12-13 Marts, 2007

DTU has given a talk presenting their tool for modeling and verification of embedded systems at the MoDES Workshop held in Søndeborg, 12-13 Marts, 2007.

Summerschool: Advanced Digital Systems Design
Conference name
Lausanne, Switzerland – 25-29th September, 2006

Two members of the cluster on Execution Platforms have been given part of a summer school/advanced course on ADVANCED DIGITAL SYSTEMS DESIGN. The participants are from industry and university. This way, results from the integrated view of embedded system design will be brought to a much larger community.

Workshop: Models of Computation and Communication
Zurich, Switzerland – 16-17th November, 2006

A Workshop on Models of Computation and Communication brought together scientists from various areas, i.e. formal methods, hardware design and software architecture, see http://www.artist-embedded.org/artist/MoCC-06.html .

Workshop: CASTENESS
15.-17th of January 2007

ETH Zurich has been organizing and participating in the CASTENESS Workshop, see www.casteness.org. The workhop put together the expertise of various EU projects such as ARTIST2, SHAPES, AETHER. In addition, ETH Zurich has been given a tutorial on issues that have been investigated in the ARTIST2 context: Analytic Performance Estimation, Mapping Algorithms to Architectures, Scalable SW Construction. The workshop has been sponsored by ARTIST2.

Workshop: Foundation and Applications of Component-based Design
EMSOFT 2006
Seoul, Korea, 2006

ETH Zurich has been organizing a Workshop at a major conference in the area of Embedded Software (EMSOFT): "Foundations and Applications of Component-based Design", October 26th 2006, Seoul. The workshop has been organized in the framework of the Embedded Systems Week (http://www.esweek.org/), which federates CODES/ISSS, EmSoft, and CASES.

Dagstuhl Seminarl: Quantitative Aspects of Embedded Systems
Sloss Dagstuhl, Germany – 4-9th March, 2007

ETH Zurich has been organizing a Dagstuhl Seminar 04.03.2007-09.03.2007: "Quantitative Aspects of Embedded Systems". The purpose was to connect the results on performance analysis in ARTIST2 with the community dealing with statistical and stochastic methods. Therefore, organizers of this workshop have been B. Haverkort (Univ. of Twente, NL), J.-P. Katoen (RWTH Aachen, DE), L. Thiele (ETH Zürich, CH), see http://kathrin.dagstuhl.de/07101/ .

Conference: Architecture of Computing Systems (ARCS'07)
Zurich, Switzerland – 12-15th March, 2007

ETH Zurich has been the general chair of the ARTIST2-sponsored conference ARCS'07: "Architecture of Computing Systems", which took place at the Swiss Federal Institute of Technology (ETH) Zurich, Switzerland, March 12-15, 2007, http://arcs07.ethz.ch/. Here, a broad audience was present which allowed disseminating results on embedded system design methods to a larger community.

Tutorial: Analysis and optimization of real time distributed embedded systems International Workshop on Embedded Systems
Seoul October 2006

Petru Eles has given a tutorial at the "International Workshop on Embedded Systems 2006", Seul October 2006. With this occasion several results obtained in the ARTIST context have been made accessible to an international audience.

Luca Benini: Tutorial: NoC Middleware – OS, Platform Services, Resource Management

Design Automation and Test in Europe, Nice, France April 2007.

The tutorial covered issues related to the software environment required to efficiently support MPSoC/NoC-based platforms. Middleware services and abstractions were discussed in details.

Luca Benini: Panel: 10 or 90? The Share of the Infrastructure in Future SoCs

Workshop on Diagnostic Services in Network-on-Chips Test, Debug, and On-Line Monitoring, Nice, France April 2007

Peter Marwedel: Tutorial: Memory architecture aware compilation

Advanced Digital Systems Design, Lausanne, Sept. 2006, http://www.artist-embedded.org/artist/Overview,299.html

Peter Marwedel: Opening tutorial: Embedded Systems: Overview and research issues

1st Summer School on Ubiquitous Computing, Dortmund, Sept. 2006

Peter Marwedel: Workshop (Chairman)

Workshop on Compiler Assisted SoC Assembly (CASA), Seoul, Oct. 2006
http://ls12-www.cs.uni-dortmund.de/~marwedel/CASA_2006.html

Peter Marwedel: Tutorial: Memory architecture aware compilation

CASTNESS Workshop and School, Rome, Jan. 2007; http://shapes.atmelroma.it/ twiki/bin/view/ShapesPublic/CastNess07

Peter Marwedel: Keynote: Performance and Predictability Improvement by Memory Architecture Aware Compilation

Infineon Workshop on Performance Modeling, Munich, Jan. 2007

Peter Marwedel: Keynote: Compiler Challenges for Embedded Design (in German)

Gesellschaft für Informatik, SIG of University Professors, April 2007, http://ira.informatik.uni-freiburg.de/gibu/jahrestreffen2007-programm.html

Peter Marwedel, Heiko Falk: Workshop (Chairmen)

10th Int. Workshop on Software and Compilers for Embedded Systems (SCOPES), Nice, April 2007, http://www.scopesconf.org/scopes-07/

Peter Marwedel: Tutorial: Memory architecture aware compilation

3rd Intern. Summer School on Advanced Computer Architecture and Compilation for Embedded Systems (ACACES), L'Aquila, July 2007, http://www.hipeac.net/acaces2007/

Lothar Thiele: Workshop: Foundations and Applications of Component-based Design

EMSOFT, October 26th 2006, Seoul

The workshop was organized by Lothar Thiele and Joseph Sifakis and brought together experts from various disciplines related to emebdded system design. One of the focus areas has been resource-awareness: Discuss recent results on component-based design with emphasis on design frameworks for real-time systems encompassing heterogeneous composition and models of computation. Especially frameworks for handling non-functional and resource constraints, design under conflicting dependability criteria, trade-offs between average performance and predictability.

http://www.esweek.org/, http://www.artist-embedded.org/artist/Overview,29.html

Lothar Thiele: Workshop: MoCC - Models of Computation and Communication

November 16-17, 2006, Zurich, Switzerland

This workshop took place at ETH Zurich. It has been recognised for long that the embedded systems domain is a multidisciplinary one which raises problems of communication and cooperation between several disciplines: software and hardware primarily but also computer science and engineering, real-time and distributed systems, telecommunication, control and signal processing etc. Each of these worlds have their own notion of such basic concepts as computation and communication which makes it difficult for designers to cooperate and achieve correct and efficient designs.

http://www.artist-embedded.org/artist/MoCC-06.html

Lothar Thiele: Dagstuhl Workshop: Quantitative Aspects of Embedded Systems

04.03.2007-09.03.2007, Dagstuhl, Germany

The workshop has been organized by B. Haverkort (Univ. of Twente, NL), J.-P. Katoen (RWTH Aachen, DE) and L. Thiele (ETH Zürich, CH). The goal of this Dagstuhl seminar was to bring together experts in the areas of embedded software design and implementation, model-based analysis of quantitative system aspects, and researchers working on extending all kinds of formal (design and analysis) methods with quantitative system aspects. These three areas are clearly well-related in the context of embedded systems, but have not been addressed as such in the past, as they have been worked upon in different communities.

Web-Page: http://kathrin.dagstuhl.de/07101/

Workshop: Models of Computation and Communication
Zurich, Switzerland – November 16-17, 2006
A Workshop Models of Computation and Communication has been taken place at ETH Zurich November 16th and 17th 2006. It brought together scientists from various areas, i.e. formal methods, hardware design and software architecture, see http://www.artist-embedded.org/artist/MoCC-06.html.

Workshop and Tutorial: Computing Architectures and SW Tools for Numerical Embedded Scalable Systems
Rom, Italy – January 15-17, 2007
ETH Zurich has been organizing and participating in the CASTNESS Workshop. The workhop put together the expertise of various EU projects such as ARTIST2, SHAPES, AETHER. In addition, ETH Zurich has been given a tutorial on issues that have been investigated in the ARTIST2 context: Analytic Performance Estimation, Mapping Algorithms to Architectures, Scalable SW Construction. The workshop has been sponsored by ARTIST2 and took place 15.-17th of January 2007.
www.casteness.org

Tutorial: Advanced Digital System Design
Lausanne, Switzerland – September 25-29, 2006
Two members of the cluster on Execution Platforms have been given part of a summer school advanced course on ADVANCED DIGITAL SYSTEMS DESIGN on 25.-29th September, Lausanne, Switzerland. The participants are from industry and university. This way, results from the integrated view of embedded system design will be brought to a much larger community.

Workshop and Tutorial: Foundations and Applications of Component-based Design
Embedded Systems Week (ESWEEK)
Seoul, Korea – October 26, 2006
ETH Zurich has been organizing a Workshop at a major conference in the area of Embedded Software (EMSOFT): „Foundations and Applications of Component-based Design“, October 26th 2006, Seoul. The workshop has been organized in the framework of the Embedded Systems Week, which federates CODES/ISSS, EmSoft, and CASES.
http://www.esweek.org/

Seminar: Quantitative Apects of Embedded Systems
Schloss Dagstuhl, Germany – March 4-9, 2007
ETH Zurich has been organizing the Dagstuhl seminar: „Quantitative Aspects of Embedded Systems“. The purpose was to connect the results on performance analysis in ARTIST2 with the community dealing with statistical and stochastic methods. Therefore, organizers of this workshop have been B. Haverkort (Univ. of Twente, NL), J.-P. Katoen (RWTH Aachen, DE), L. Thiele (ETH Zürich, CH).
http://kathrin.dagstuhl.de/07101/.

Conference: Architecture of Computing Systems (ARCS) 2007
ETH Zurch, Switzerland – March 12-15, 2007

ETH Zurich has been the general chair of the ARTIST2-sponsored conference ARCS'07: „Architecture of Computing Systems“, that took place at the Swiss Federal Institute of Technology (ETH) Zurich, Switzerland, March 12-15, 2007. Here, a broad audience was present which allowed disseminating results on embedded system design methods to a larger community.
http://arcs07.ethz.ch/

Tutorial: Analysis and Optimization of Real-Time Distributed Embedded Systems
International Workshop on Embedded Systems
Seoul, Korea – October, 2006
Petru Eles has given a tutorial at the “International Workshop on Embedded Systems", Seoul October 2006. With this occasion several results obtained in the ARTIST context have been made accessible to an international audience.

Tutorial: Extensible Frameworks for System-Level Analysis of Real-Time Systems
Real-Time and Embedded Technology and Applications Symposium (RTAS)
San Jose, USA – April 4, 2006
TU Braunschweig has organized together with ETH Zürich and University of Notre Dame the tutorial "Extensible Frameworks for System-Level Analysis of Real-Time Systems" at the Real-Time and Embedded Technology and Applications Symposium (RTAS). The tutorial took place April 4, 2006.

Worshop: Models and Analysis for Automotive Systems
Real-Time Systems Symposium (RTSS)
Rio de Janeiro, Brasil – December 5, 2006
TU Braunschweig participated in the “Workshop on Models and Analysis for Automotive Systems” at the Real-Time Systems Symposium (RTSS). The talk was named and discusses “The Need of a Timing Model for the AUTOSAR Software Standard”. The workshop took place December 5, 2006.

Conference: Design Automation and Test in Europe (DATE) 2007
Nice, France – April 16-20, 2007
TU Braunschweig has been organizing the Embedded Software Track at the major European conference on design automation DATE (Design Automation and Test in Europe) that took place April 16-20, 2007. The track was devoted to modelling, analysis, design and deployment of embedded software, including formal methods, tools, methodologies and development environments. Thereby, the emphasis was on embedded software platforms, software integration and portability issues.

Tutorial: Supporting Predictable Design Using Formal Analysis Techniques
Nässlingen, Sweden– August 23, 2006
TU Braunschweig has given a lecture with the title “Supporting Predictable Design Using Formal Analysis Techniques” at the ARTES summerschool (A Network for Real-Time Research and Graduate Education in Sweden) that took place in Nässlingen, Sweden, August 23, 2006. The audience consisted of Phd Students from the field of real-time research, which allowed disseminating recent results in embedded system design to related research teams (mainly) in Scandinavia.

Special session: Virtual Automotive Platforms
Design Automation Conference (DAC)
San Diego, USA – June 6, 2007

TU Braunschweig was invited to participate in the special session on "Virtual Automotive Platforms" at the renowned Design Automation Conference (DAC). The talk "Automotive Software Integration" showed how formal techniques can be applied to solve performance related integration problems in the design process of complex modern automotive systems. The special session took place June 6, 2007.

Workshop: Tool Platforms for Modelling, Analysis and Validation of Embedded Systems
Conference on Computer Aided Verification (CAV)
Berlin, Germany – July 1-2, 2007
TU Braunschweig was invited to participate in the ARTIST workshop on "Tool Platforms for Modelling, Analysis and Validation of Embedded Systems" at the conference on Computer Aided Verification (CAV).The talk "SymTA/S - Modeling system timing using abstract event streams" allowed disseminating results in the field of compositional performance verification techniques to a larger community. The workshop took place July 1-2, 2007.

The following keynote and tutorial have been delivered around the topic of this activity. They have contributed to the dissemination of the research results to the broad community, both in industry and academia, and also beyond the borders of Europe.

Keynote: "Chips i alt" (eng. "Chips everywhere")
Tåstrup, Denmark – May 30, 2007

Speaker: Jan Madsen

The Danish Academy of Technical Sciences held a one-day seminar with the title "Chips everywhere". Jan Madsen gave a keynote speech on the system challenges of designing wireless sensor networks, particular emphasizing the challenges of making these systems energy-aware in order to extend their life-times. The seminar was attended by approximately 50 people, of which most were from companies with strong interests in embedded systems.

Tutorial: "Low Power CMOS Design: The Fabrics: Research Front-end"
Asian-Pacific Design Automation Conference**,** *Yokohama, Japan, January 23 2007.*

The tutorial coverer research front-ends of low power CMOS design, including (1) process and device level, (2) circuit level, (3) EDA level, and (4) system level. The focus of the presentation given by Luca Benini was on system-level power optimization

http://www.aspdac.com/aspdac2007/tutorial/index.html

5.5 Control for Embedded Systems

Invited lectures

- Model based development of Automotive embedded systems. Electronics in Vehicles (IBC Euroforum conference), April 17-18, Gothenburg By Martin Törngren
- Challenges for automotive embedded systems. Enea Automotive Systems Meeting, March 22, Stockholm By Martin Törngren
- Real-Time Aspects in Control, ANIPLA, November 15, Rome. By Karl-Erik Årzén
- Simulation of Networked Control Systems Using TrueTime, 3rd International Workshop on Networked Control Systems: Tolerant to Faults, Nancy, France, June 2007. By Anton Cervin

- Jitterbug and TrueTime: MATLAB tools for Analysis and Simulation of Controller Timing, Plenary lecture at the Mexican National Congress of Automatic Control, Mexico City, October 2006. By Anton Cervin

Workshops

- A cluster session on Tools for Co-Design of Control Systems and Their Real-Time Implementation at the IEEE International Symposium on Computer-Aided Control Systems Design (CACSD), Thursday October 5, 2006, with representatives from industry (e.g. the Mathworks) and several academic communities (including AADL).
- The KTH/Industry Embedded systems seminar, August 30th, 2007. http://www.md.kth.se/RTC/KTH_es_seminar2007.html
- Towards a Systematic Approach to Embedded System Design April 20th, 2007 – Workshop at the DATE conference. http://www.artist-embedded.org/artist/-ARTIST2-Workshop-at-Date-07-.html
- Tool Platforms for ES Modelling, Analysis and Validation July 1-2, 2007 - satellite event of CAV 2007, Berlin, Germany. http://www.artist-embedded.org/artist/-Tool-platforms-for-modelling-.html
- The Tool Exhibition organized by SNART (Swedish National Real-Time Association) (chaired by Anton Cervin of LTH) as part of the Real-Time in Sweden Symposium, Västerås, August 2007. In this exhibition several of the tools developed for embedded system design within Artist2 were presented, including the LTH and KTH tools.

Graduate courses

Graduate Course on Control for embedded systems (Lund, May 2007). http://www.control.lth.se/user/karlerik/ArtistEmbedded/

Autumn 2006: Design of Embedded Real-time Systems: a graduate course given within the Artes++ graduate school – with invited speakers from Artist2 affiliated industries (Volvo, Daimler-Chrysler, Saab), with in total 20 participants including PhD students and industrial participants. http://www.md.kth.se/RTC/Derts06/index.html

Four lectures on “Control for Embedded Systems - Introduction and Motivation” within the Artist2/UNU-IIST School, Suzhou, August 2007. By Karl-Erik Årzén

Graduate course on Embedded Control Systems, UNED, Madrid, April 2007. By Karl-Erik Årzén

Jitterbug and TrueTime: MATLAB tools for Analysis and Simulation of Controller Timing, Pre-congress graduate course, National Autonomous University of Mexico (UNAM), Mexico City, October 2006. By Anton Cervin.

Graduate course on “Embedded Control - Controller Implementation with ResourceLimitations”, Aalborg University, January 2007. By Karl-Erik Årzén.

Summer School – Embedded RTLinux Intro 2007, CTU Prague, Czech Republic, June 18th – 22nd, 2007, http://rtime.felk.cvut.cz/rtlinuxss07/

The keynotes, workshops and tutorials related to this activity have all been reported as parts of the three involved cluster's internal cluster activity reports.

Keynote: Real-Time Aspects in Control,. By Karl-Erik Årzén
Conference name: ANIPLA, November 15 2006, Rome, Italy

Workshop: Control of Real-Time Computing in Artist2
Conference name: FeBID'07 (Second International Workshop on Feedback Control Implementation and Design in Computing Systems and Networks), Munich, Germany – May 25, 2007

A poster session presenting the work related to this workshop within Artist2 was organized. The session contained contributions from LUND, Aveiro, UPC, and SSSA/Pisa. A negative factor that limited the participation both in this poster session and at the entire workshop was the high conference fee enforced by the 10th IFIP/IEEE Symposium on Integrated Management (IM 2007) which the workshop was co-located with.

Workshop : 2nd Int'l ARTIST Workshop on Control for Embedded Systems
Location: University of Illinois, Urbana-Champaigne, Illinois, US, May 31 – June 1, 2007

The second in the series of International Workshops in Control for Embeded Systems was organized by the cluster at Urbana-Champaigne is Illinois with Tarek Abdelzaher as the local host. The formal topics of the workshop were Real-Time and Control in Sensor/Actuator Network, Control in Cyber-Physical Systems, Event-Based Control and Computing, and Control of Software Errors. However, several of the presentations given were very relevant also for this activity. This cluster was represented by LUND, KTH and UPVLC. More information about the workshop including the conclusions are available at

http://www.artist-embedded.org/artist/-Control-for-Embedded-Systems,810-.html

Tutorial Session: Toward a Component-Based Framework for Networked Control,
Conference name: European Control Conference, Kos, Greece, July 2-5.

An invited tutorial session about control-related issues in wireless networked embedded systems was held as a part of the ECC conference. The session contained three presentations authored by members of this cluster.

The members of this activity given four keynotes or plenary addresses, organized one tutorial session, organized one international workshop, one national workshop, and four summer shool or graduate courses.

Keynote: Real-Time Aspects in Control,. By Karl-Erik Årzén
Location: ANIPLA, November 15 2006, Rome, Italy

Plenary Paper: Embedded systems: From Design to Implementation. [A. Crespo, P. Albertos and J. Simo.
Location: IFAC Symposium on Cost Oriented Automation. Havana . 2007.

Keynote: New Control Challenges in the Design of Embedded Control Systems. P. Albertos and A. Crespo.
Location: 2007 IEEE Multiconference on Systems and Control. Singapore. 2007.

Keynote: Wireless Control Systems: Scientific Challenges and Emerging Applications, Karl Henrik Johansson
Location: 15th Mediterranean Conference on Control and Automation, Athens, Greece, 27-29 Jun, 2007

Workshop : 2nd Int'l ARTIST Workshop on Control for Embedded Systems
Location: University of Illinois, Urbana-Champaigne, Illinois, US, May 31 – June 1, 2007
The second in the series of International Workshops in Control for Embeded Systems was organized by the cluster at Urbana-Champaigne is Illinois with Tarek Abdelzaher as the local host. The formal topics of the workshop were Real-Time and Control in Sensor/Actuator Network, Control in Cyber-Physical Systems, Event-Based Control and Computing, and Control of Software Errors. However, several of the presentations given were very relevant also for this activity. This cluster was represented by LUND, KTH and UPVLC. More information about the workshop including the conclusions are available at

http://www.artist-embedded.org/artist/-Control-for-Embedded-Systems,810-.html

Summer School: 3rd Artist2 Graduate School on Embedded Control Systems. All cluster members
Location: Lund University, May, 2007
The third graduate school organized by the cluster on embedded control was successfully given in Lund in May 2007. In addition to lectures and laboratories given and organized by the core partners the course also contained four industrial presentations related to embedded control from ABB, Ericsson, Volvo, and Dynasim. More information about the course can be found on

http://www.artist-embedded.org/artist/Objectives-and-Scope,880.html

Summer School Participation: Four lectures on "Control for Embedded Systems - Introduction and Motivation" within the Artist2/UNU-IIST School, By Karl-Erik Årzén
Location: Suzhou, August 2007.

Course: Graduate course on Embedded Control Systems. By Karl-Erik Årzén
Location: UNED, Madrid, April 2007.

Course: Graduate course on "Embedded Control - Controller Implementation with Resource Limitations". By Karl-Erik Årzén.
Location: Aalborg University, January 2007

Tutorial Session: Toward a Component-Based Framework for Networked Control,
Conference name: European Control Conference, Kos, Greece, July 2-5.
An invited tutorial session about control-related issues in wireless networked embedded systems was held as a part of the ECC conference. The session contained three presentations authored by members of this cluster.

Workshop: Embedded systems colloquium
Location: CTU Prague, Czech Republic, February 1st, 2007

Course: Design of Embedded Real-time Systems: a graduate course given within the Artes++ graduate school – with invited speakers from Artist2 affiliated industries
Location: KTH, Autumn 2006

5.6 Testing and Verification

The partners have regular meetings at various Phd schools and workshops where the give invited lectures and tutorials (see below). Also, they have participated in cross-cluster workshops at conferences (CAV 2007, DATE 2007).

Keynotes :

Thierry Jéron gave a keynote speech on /Model-based test selection for infinite state reactive systems/ at the 5th International Symposium on Formal Methods for Components and Objects (FMCO'06, Amsterdam, November 2006).

http://fmco.liacs.nl/fmco06.html

Kim G. Larsen (invited talk): 10 Years of UPPAAL: From Theory to Industrial Impact. International Workshop on Advances in Model-Checking in honour of Gerard J. Holzmann. December 2006. University of Twente, Endschede, The Netherlands.
http://wwwhome.cs.utwente.nl/~kuntzwgm/WorkshopMCProgram.php

Kim G. Larsen (invited talk): UPPAAL Tiga -- Controller Synthesis for Real-Time Systems. December 2006. Centre Federe on Verification. Brussels, Belgium.

Workshops:

Kim G. Larsen and Jan Madsen: Validation and Performance Analysis of Real-Time Systems in UPPAAL. Towards a Systematic Approach to Embedded System Design: Bringing Leading-Edge Embedded Systems Design Tools to Industrial Users. ARTIST2 workshop at DATE, Nice, France, April 2007.

http://www.artist-embedded.org/artist/-ARTIST2-Workshop-at-Date-07-.html

Kim G. Larsen and Michael R. Hansen: Validation and Performance Analysis of Real-Time Systems in UPPAAL. ARTIST WS: Tool Platforms for ES Modelling, Analysis and Validation. Computer Aided Verification, July 2007.

http://www.artist-embedded.org/artist/-Tool-platforms-for-modelling-.html

Kim G. Larsen: UPPAAL after ten years. Workshop on Applied Concurrency Research in Industry, (IFIP Working Group on Concurrency Theory) Affiliated with CONCUR, September 7, 2007, Lisbon, Portugal.
http://www.ru.is/luca/ifipworkshop/

Tutorials :

Vlad Rusu gave a talk on Model-based testing at the MOTIVES 07 Winter school in Trento (February 2007).

http://www.artist-embedded.org/artist/Overview,577.html

Alexandre David and Kim G. Larsen (invited mini course): Validation and Verification of Embedded and Real Time Systems. October 17, 2006, Reykjavik University, Iceland.

Brian Nielsen: Model-based Testing of Real-Time Systems. TESTCOM/FATES, June 26-29, 2007, Tallin, Estonia.
http://testcom-fates07.ioc.ee/tutorials.html

Gerd Behrmann and Kim G. Larsen (invited tutorial): Real Time Validation of Embedded Systems Using UPPAAL International PhD School on Verification of Protocols for Security and Mobility, IT-University, Copenhagen, Denmark, October 9-13, 2006

Bernard Boigelot. Hybrid Acceleration. Dagstuhl Seminar on "Open Systems: Testing, Verification and Synthesis", Schloss Dagstuhl, Germany. October 2006.

Hichem Boudali, Dynamic fault tree analysis using I/O interactive Markov chains, Quantitative Aspects of Embedded Systems, Dagstuhl Seminar, Germany, 4-9 March 2007.

Hichem Boudali, A compositional semantics for Dynamic Fault Trees in terms of Interactive Markov Chains, Verification and Validation of Software Systems Symposium, LaQuSo, Eindhoven University of Technology, Eindhoven, the Netherlands, 23 March 2007.

Hichem Boudali, A Temporal Bayesian Network Reliability Framework, International Mathematical Methods in Reliability (MMR) Conference, Glasgow, Scotland, 1-4 July 2007.

Ed Brinksma, The Challenges of Embedded Systems Engineering, Invited Speaker, Hybrid Systems: Computation and Control, 10th International Workshop, HSCC 2007, Pisa, Italy, 4 April 2007.

Ed Brinksma, Models & Design, Invited Speaker, Conference on Systems Engineering Research, CSER 2007, Hoboken, NJ, USA, 15 March 2007.

Ed Brinksma, Conformance Testing & Test Coverage, Invited Lecture ARTIST2-MOTIVES Winter School, Trento, 23 February, 2007.

Ed Brinksma, A Short History of Modelling and Model Checking at Twente, International Workshop on Advances in Model-Checking in honour of Gerard J. Holzmann. December 2006. University of Twente, Enschede, The Netherlands.

P. Crouzen, CORAL - a tool for COmpositional Reliability and Availability anaLysis. Berlin, Germany, July 2, 2007.

Alexandre David and Kim G. Larsen (invited mini course): Validation and Verification of Embedded and Real Time Systems. October 17, 2006, Reykjavik University, Iceland.

Thomas A. Henzinger, Quantitative Generalizations of Languages, invited lecture, 11th International Conference on Developments in Language Theory (DLT), Turku, Finland, July 2007.

Thomas A. Henzinger, Games, Time, and Probability: Graph Models for System Design and Analysis, invited lecture, 33rd International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM), Harrachov, Czech Republic, January 2007.

Thomas A. Henzinger, Timed Alternating-Time Temporal Logic, invited lecture, Fourth International Workshop on Formal Modeling and Analysis of Timed Systems (FORMATS), Paris, France, September 2006.

Thomas A. Henzinger, Model Checking, Theorem Proving, and Abstract Interpretation: The Convergence of Formal Verification Technologies, invited lecture, Grand Challenges of Informatics Symposium, Budapest, Hungary, September 2006.

Thomas A. Henzinger, From Graph Models to Game Models, invited lecture, 25 Years of Model Checking Celebration, Seattle, Washington, August 2006.

Thomas A. Henzinger, Fine-Tuning the Dial between Model Checking and Program Analysis, invited lecture, Third Annual Alpine Verification Meeting, Aussois, France, April 2007.

Thierry Jéron, Model-based test selection for infinite state reactive systems, 5th International Symposium on Formal Methods for Components and Objects FMCO'06, Amsterdam, November 2006.

Kim G. Larsen (invited talk): 10 Years of UPPAAL: From Theory to Industrial Impact. International Workshop on Advances in Model-Checking in honour of Gerard J. Holzmann. December 2006. University of Twente, Enschede, The Netherlands.

Kim G. Larsen (invited talk): UPPAAL Tiga -- Controller Synthesis for Real-Time Systems. December 2006. Centre Fédéré en Verification. Brussels, Belgium.

Kim G. Larsen (invited talk): Optimal Scheduling and Controller Synthesis. ARTIST2 - MOTIVES MOdelling, TestIng, and Verification for Embedded Systems. February 2007. University of Trento.

Kim G. Larsen (invited talk): Optimal Scheduling and Controller Synthesis. Dagstuhl Seminar on Run-Time Verification, January 2007.

Kim G. Larsen (invited talk): Quantitative Analysis and Optimal Scheduling of Embedded Systems Using UPPAAL and UPPAAL Cora. Dagstuhl Seminar on Quantitative Aspects of Embedded Systems, March 2007.

Kim G. Larsen and Jan Madsen (invited talk): Validation and Performance Analysis of Real-Time Systems in UPPAAL. Towards a Systematic Approach to Embedded System Design: Bringing Leading-Edge Embedded Systems Design Tools to Industrial Users. ARTIST2 workshop at DATE, Nice, France, April 2007.

Kim G. Larsen and Michael R. Hansen (invited talk): Validation and Performance Analysis of Real-Time Systems in UPPAAL. ARTIST WS: Tool Platforms for ES Modelling, Analysis and Validation. Computer Aided Verification, July 2007.

Kim G. Larsen (invited tutorial): Validation of Real-Time and Embedded Systems; ARTIST/China School on Embedded Systems Design, Aug 1-11, 2007, SuZhou, China.

Kim G. Larsen (invited talk): UPPAAL after ten years. Workshop on Applied Concurrency Research in Industry, (IFIP Working Group on Concurrency Theory) Affiliated with CONCUR, September 7, 2007, Lisbon, Portugal.

Brian Nielsen (invited tutorial): Model-based Testing of Real-Time Systems. TESTCOM/FATES, June 26-29, Tallin, Estonia.

Jean-Francois Raskin. Invited Talk. ``Controller Synthesis''. ARTIST2 - MOTIVES MOdelling, TestIng, and Verification for Embedded Systems. February 2007. University of Trento.

Jean-Francois Raskin. Invited Talk. ``Controller Synthesis using Lattice Theory''. IEEE CDC2007. December 2007. New-Orleans, USA.

Jean-Francois Raskin. Invited Talk. Improved Algorithms for the Automata-Based Approach to Model-Checking. International Workshop on Advances in Model-Checking in honour of Gerard J. Holzmann. December 2006. University of Twente, Endschede, The Netherlands.

Jean-Francois Raskin. A lattice theory to solve games of imperfect information. Invited talk. Summer Research Insititute. July 2006. Ecole Polytechnique Federale de Lausanne, Switzerland.

Jean-Francois Raskin. Fixpoint-based Abstraction Refinements. Concurrency seminar. Computer Science Department, Oxford, England, May, 2007.

Jean-Francois Raskin. Improved Algorithms for the Automata-based Approach to Model-Checking. Seminaires de l'IRCCyN. Unite Mixte de Recherche (UMR) 6597 du CNRS. Ecole Centrale de Nantes. France. February 2007.

Jean-Francois Raskin. A Lattice Theory to Solve Games of Imperfect Information. Dagstuhl Seminar on "Open Systems: Testing, Verification and Synthesis", Schloss Dagstuhl, Germany. October 2006.

Vlad Rusu, Combining verification and testing for reactive systems, IPA Dutch spring school in Computer Science, Vught, Netherlands, April 2006.

Vlad Rusu, Model-based testing, invited tutorial MOTIVES 07 Winter school in Trento, February 2007.

Mariëlle Stoelinga, Time and Resource interfaces, Quantitative Aspects of Embedded Systems, Dagstuhl Seminar, Germany, 4-9 March 2007.

Pierre Wolper; Computing Closures by Automata. AFADL'07, Namur, Belgium, june 2007

Wang Yi organized and contributed to the ARTIST/China School on Embedded Systems Design, Aug 1-11, 2007, SuZhou, China.

Workshop: 3rd workshop on Formal and Computational Cryptography.
Venice, Italy, July 5th 2007.

Cryptographic protocols are small distributed programs that add security services, like confidentiality or authentication, to network communication. Since the 1980s, two approaches have been developed for analyzing security protocols. One of the approaches relies on a computational model that considers issues of complexity and probability. The other approach relies on a symbolic model of protocol executions in which cryptographic primitives are black boxes.
The workshop focuses on the relation between the symbolic (Dolev-Yao) model and the computational (complexity-theoretic) model. Recent results have shown that in some cases the symbolic analysis is sound with respect to the computational model. Recent results have shown that in some cases the symbolic analysis is sound with respect to the computational model. A more direct approach which is also investigated considers symbolic proofs in the computational model. The workshop seeks results in any of these areas, and more generally, in the area of system and program verification for security and cryptography.
http://www-verimag.imag.fr/~lakhnech/FCC/

Summer School: Fosad-Artist FOSAD International School on Foundations of Security Analysis and Design.
Bertinoro, Italy, 10-16 September 2006.

The *International School on Foundations of Security Analysis and Design* (FOSAD) has been one of the foremost events established with the goal of disseminating knowledge in this critical area. The main aim of the FOSAD school is to offer a good spectrum of current research in foundations of security - ranging from programming languages to analysis of protocols, from cryptographic algorithms to access control policies and trust management - that can be of help for graduate students and young researchers from academia or industry that intend to approach the field..

http://www.sti.uniurb.it/events/fosad/

Workshop: Artist workshop on the verification of security properties of embedded systems.
Trento, Italy, February 22nd 2007.

In this workshop we have brought together the members of the activity "verification of security properties" of the ARTIST 2 project. Goal of the workshop was to foster cooperation, exchange ideas, plan new actions and outline future research directions for the NoE.

http://wwwhome.cs.utwente.nl/~etalle/meeting_artist/program_day_2.txt

Workshop: 2nd International Workshop on Security and Trust Management.
Hamburg, Germany, September 20th 2006.

Main goals of the workshop were to investigate the foundations and applications of security and trust in ICT, and ro study the deep interplay between trust management and common security issues such as confidentiality, integrity and availability. STM 2006 has also provideda platform for presenting and discussing emerging ideas and trends.

http://www.hec.unil.ch/STM06/index.htm

Conference: IFIPTM 2007: Joint iTrust and PST Conferences on Privacy, Trust Management and Security
Moncton, Canada – July 30th – August 2nd 2007.

In 2007, the iTrust and PST conferences joined together with IFIP as IFIPTM 2007 to provide a truly global platform for the reporting of research, development, policy and practice in the interdependent areas of Privacy, Security, and Trust. The annual iTrust international conference has provided a forum with a multidisciplinary perspective: economic, legal, psychology, philosophy, sociology as well as information technology, is built on the work of the iTrust working group (http://www.itrust.uoc.gr), and has had four highly successful conferences in Europe to date.

http://www.unb.ca/pstnet/itrust-pst2007/

Keynote: S. Kremer. Formal analysis of an electronic voting protocol in the applied pi calculus. Workshop on the security of electronic voting (VETO'07)
Paris, France, April 26-27, 2007

http://www.lepolytechnicien.org/veto-07/

Keynote: Fabio Martinelli: Modelling, verification and synthesis of secure systems. 2nd International Workshop on Views On Designing Complex Architectures (VODCA'06). Bertinoro, Italy, September 16-17 2006

Panel: S. Kremer. Information hiding: state-of-the-art and emerging Trends.
5th International Workshop on Security Issues in Concurrency (SecCo'07)
Lisbon, Portugal, September 3, 2007

http://www.dsi.uniroma1.it/~gorla/SecCo07/

Tutorial: Introduction to Trust Management
FOSAD 2006 6th International School of Foundations of Security Analysis and Design
Bertinoro, Italy, September 10-16 2006.

6. Artist2 Web Portal

6.1 Objectives and Background Information

The Artist2 Web Portal, complemented by the Artist2 Newsletter, is a major tool for Spreading Exellence within the Embedded Systems Community. Its aim is rather ambitious: to be the focal point of reference for events and announcements of interest to the embedded systems community.

The web portal disseminates information about contacts (Artist2 core and affiliated partners), the Artist2 JPA activities, as well a fairly thorough set of links to sites of interest to the embedded systems community.

As can be seen, a great deal of effort has been put into the web site, both for ergonomics/graphical quality, as for the contents.

The web site includes several features that help keep it coherent and up to date:

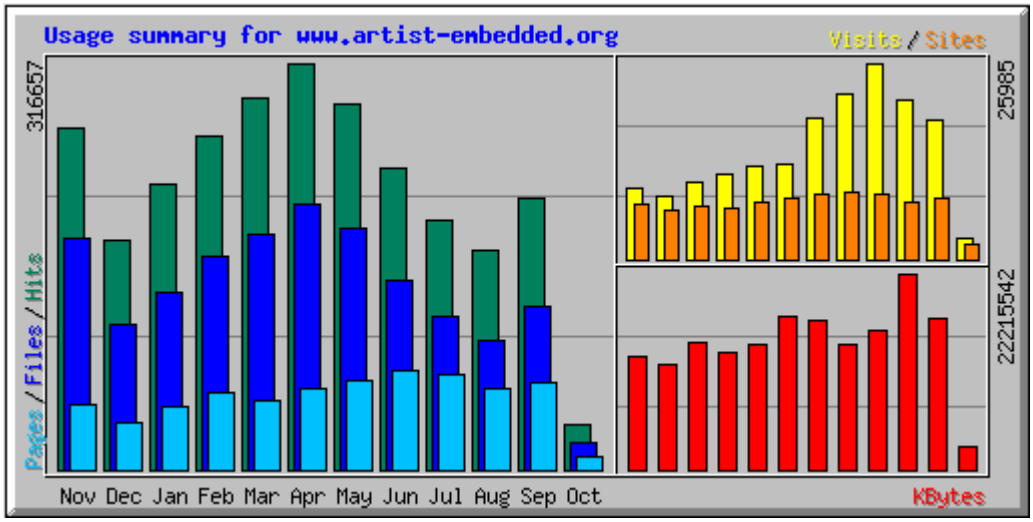
- Authorised users (principally, the Artist2 partners) can access the back end of the site to modify and update information directly. The changes are immediately visible on the site, which greatly streamlines the updating process.
- It's possible to track changes and go back to previous versions of individual web pages.
- Events are automatically sorted by date, and transferred to 'Past Events'. When appropriate.
- Structural information (hierarchy of pages) is maintained automatically.
- Ergnomics are set for the entire site. The "look and feel" of the site is always homogeneous thoughout the site. It's possible to change these ergonomics, and these changes are applied homogeneously throughout the site, via automated machanisms.

6.2 Analysis of Visits to the Portal

The main conclusion from this analysis is that visits to the site are largely driven by the Artist2 events organised (workshops, conferences, schools), and that this drives visits to the other sections: “Embedded Systems Links”, and “Research and Integration”.

It is important to note that a deep analysis of the pertinence and effectivity of the web portal needs to go beyond the numerical analysis provided here. The real impact is in whether or not the members of the community find the information relevant, and how it helps them in their daily tasks.

6.2.1 Number of Visits over the past Year



Over the course of the year, we see a bell-shaped evolution in the number of visits, with a peak in April, which corresponds to the large number of workshops that were organized in that period:

- UML&AADL’2007 *July 14th, 2007*
- FCC 2007 *July 4-5, 2007*
- CAV 2007 *July 3-7, 2007*
- ARTIST WS: Tool Platforms for ES Modelling, Analysis and Validation *July 1-2, 2007*
- ARTIST2 PhD Course on: Automated Formal Methods for Embedded Systems *June 4-12, 2007*
- 2nd Int’l ARTIST Workshop on Control for Embedded Systems *May 31st - June 1st 2007*
- FMGALS’2007 *May 29th, 2007*
- ARTIST2 Graduate Course on Embedded Control Systems *May 7-11, 2007*
- SCOPES 2007 *April 20th, 2007*
- Towards a Systematic Approach to Embedded System Design *April 20th, 2007*
- IRTAW-13 *April 17-19, 2007*
- HSCC’07 *April 3-5, 2007*
- NeRES 2007 *April 2nd, 2007*
- SLA++P 2007 *March 31st, 2007*
- Real-Time Microcontroller Systems: OSEK Standard and experiments on µcontroller devices *March 26-28, 2007*

- ARCS 2007 *March 12-15, 2007*

A detailed view of the visits over the past year is provided here:

Summary by Month

Month	Daily Avg				Monthly Totals					
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
Oct 2007	7021	4283	2017	563	1982	2577585	2816	10087	21416	35108
Sep 2007	7068	4214	2249	615	8073	17078648	18464	67494	126426	212057
Aug 2007	5520	3222	2015	683	7617	22215542	21185	62469	99896	171135
Jul 2007	6253	3865	2385	838	8635	15773820	25985	73958	119834	193865
Jun 2007	7835	4935	2574	730	8821	14197288	21904	77230	148074	235073
May 2007	9201	6041	2256	604	8609	16985423	18741	69940	187287	285252
Apr 2007	10555	6885	2102	418	7995	17333912	12551	63083	206563	316657
Mar 2007	9322	5910	1757	399	7644	14202757	12379	54483	183225	289005
Feb 2007	9277	5921	2162	399	6888	13226803	11183	60556	165796	259780
Jan 2007	7154	4453	1562	327	7132	14501197	10165	48423	138050	221793
Dec 2006	5745	3633	1198	268	6467	11824201	8337	37149	112634	178125
Nov 2006	8856	5994	1697	317	7255	12699768	9533	50920	179821	265690
Totals						**172616944**	**173243**	**675792**	**1689022**	**2663540**

6.2.2 Visits Distribution

The table below shows the distribution of visits to the various parts of the portal.

- 15.4% of the visits are to the “Research and Integration” section, which describes the technical work done within Artist2 (based on information from the deliverables)
- 40.9% of the visits are to the “Dissemination” section, which provides information and pointers about Artist2 events and results. Of these, a full 30.3% of the total visits to the portal are to the Workshops section, where the home pages of many Artist2 workshops are located.
- 29.6% of the visits are to the “Embedded System Links” section, which provides more general information relevant to the area.

▶ 15. About the Artist2 NoE	2.3%
▶ 20. Participants	7.4%
▼ 25. Research and Integration	15.4%
▶ 20. Cluster: Real-Time Components	6%
▶ 30. Cluster: Adaptive Real-Time	1.9%
40. Cluster: Compilers and Timing Analysis	0.5%
▶ 50. Cluster: Execution Platforms	1.8%
▶ 60. Cluster: Control for Embedded Systems	3.5%
▶ 70. Cluster: Testing and Verification	1.5%
▼ 30. Dissemination	40.9%
▶ 20. Workshops	30.3%
▶ 30. Schools and Seminars	6%
60. Publications	2.3%
▶ 70. Contributions to Standards	2.2%
▼ 35. Embedded System Links	29.6%
10. Journals	3.3%
▶ 20. Conferences	5.9%
25. Hot Topics	0.4%
30. Standards	0.8%
▶ 35. Tools and Platforms	3%
▶ 40. Main Projects	4.9%
50. Position Papers	1.4%
55. Roadmaps	0.7%
60. Newsletters and Magazines	1.7%
▶ 70. Announcements	6.8%
80. Publications	0.7%
▶ 40. intranet	1.3%
▶ 70. Reviews	2.1%
76. Reporting on Mobility	0.6%

6.2.3 Google keywords used to access the site

A representative sample of recent google searches, used to access the site, include the following. It's very interesting to note how well the portal is placed, when searches on topics not directly related to the NoE are used.

NB: These links are active, so you can see the results of the google search yourself by clicking on the keywords.

- « artist Embedded Components » (2)
- « EMSOFT 2008 » (2)
- « amba axi tutorial » (2)
- « artist embedded » (2)
- « scopes » (2)
- « castness »
- « hipeac »
- « paul caspi retirement »
- « autosar stack »
- « "semantic level" component »
- « eth zurich phd positions »
- « rtcsa 2008 »
- « postdoctoral position 2008 signal »
- « artist2 »
- « cluster testing »
- « sponsored by SigBED »
- « journal european embedded systems »
- « "Yi ZHang" Northwest Polytech »
- « Codesign Tools for Embedded Control Systems »
- « RTSS 2008 »
- « research topic embedded »
- « Artist2 »
- « artist »
- « timing analysis automotive »
- « embedded system magzine journal »
- « embedded system Ph. D. topics »
- « Dimitrios Soudris »
- « university of dortmund isa description language »
- « current seminar on embedded systems »
- « low power Sensorik »
- « open phd position 2007 embedded software »
- « the artist newsletter »
- « Embedded journals »
- « Francky Catthoor »
- « ARTEMIS European Technology Platform »
- « ARTIST2 »
- « speeds project verimag »
- « jacques pulou caspi »
- « Mathai Joseph »
- « industrial informatics transactions »
- « runtime load variation on operating system
- « how to build a web based verification portal » (2)
- « 2007 email contacts of noe » (2)
- « artist » (2)
- « artemisia association » (2)
- « iso/iec tr 18037:2004 » (2)
- « motives 2007 »
- « post doc middleware »
- « Posix 1003 »
- « heterogeneous network petru eles »
- « artist2 »
- « rtcsa 2008 »
- « automotive technology online course material »
- « manufacturing automation exhibitions in europe »
- « Suitability Analysis Process of component »
- « Embedded Systems & Advanced Digital Systems Design »
- « summer school unu iist »
- « posix 1003 standard »
- « rtas 2008 »
- « Computer process control using matlab phd thesis »
- « årzen real-time tutorial »
- « flexray trend »
- « exemplary embedded system lecture »
- « university of twente strategic management »
- « castness »
- « Artist »
- « Dagstuhl WCET »
- « Huibiao zhu »
- « ARTIST2 European Platform »
- « Autosar timing »
- « Issue of Education »
- « co-design survey »
- « qvt mof »
- « Laura VANZAGO »
- « Peter Marwedel, (2006) Embedded System Design »
- « artist component based design »
- « artist embedded org »
- « Real time uml »
- « CODES ISSS »
- « open phd positions »

performance »
- « siconid »
- « openings in embdded system »
- « Engineering conference in south korea by october 2007 »
- « what is verification in testing? »
- « "a generic model of contracts for embedded systems" »
- « phd position at aalborg »
- « danes embedded intelligent system »
- « IMEC Francky Catthoor »
- « LO BELLO LUCIA »
- « dataflow "schedulability analysis" tool »
- « ARTIST2 (ARTIST IS THE EUROPEAN NETWORK ON EMBEDDED SYSTEMS) WORKSHOP ON INTEGRATED MODULAR AVIONICS (IMA) »
- « OSEK NM »
- « embedded systems artist »
- « artist Embedded Components » (2)
- « EMSOFT 2008 » (2)
- « amba axi tutorial » (2)
- « artist embedded » (2)
- « scopes » (2)
- « castness »
- « hipeac »
- « paul caspi retirement »
- « autosar stack »
- « "semantic level" component »
- « eth zurich phd positions »
- « rtcsa 2008 »
- « postdoctoral position 2008 signal »
- « artist2 »
- « cluster testing »
- « sponsored by SigBED »
- « journal european embedded systems »
- « "Yi ZHang" Northwest Polytech »
- « Codesign Tools for Embedded Control Systems »
- « RTSS 2008 »
- « research topic embedded »
- « Artist2 »
- « artist »
- « timing analysis automotive »
- « embedded system magzine journal »
- « embedded system Ph. D. topics »
- « Dimitrios Soudris »
- « university of dortmund isa description language »
- « current seminar on embedded systems »
- « low power Sensorik »
- « open phd position 2007 embedded software »
- « the artist newsletter »
- « Embedded journals »
- « analytic performance model MPSOC »
- « Artist 2 2007 »
- « Artist2 2007 Rome »
- « dspic course »
- « integrated modular avionics »
- « RT-LEAST »
- « stockholm post »
- « Real Time Components Inc »
- « scope versus objective »
- « matlab programme advanced process control »
- « najla chamseddine »
- « PhD research topics Computer Engineering »
- « artemisia association artemis »
- « aims objectives and scope »
- « "A Calculus for Network Delay, Part II: Network Analysis" »
- « volvo cars strategic management »
- « integrated real time control system »
- « rise time sampling period »

- « Korea international collaboration »

- « industrial informatics transactions »
- « runtime load variation on operating system performance »
- « siconid »
- « openings in embdded system »
- « Engineering conference in south korea by october 2007 »
- « what is verification in testing? »
- « "a generic model of contracts for embedded systems" »
- « phd position at aalborg »
- « danes embedded intelligent system »
- « IMEC Francky Catthoor »
- « LO BELLO LUCIA »
- « dataflow "schedulability analysis" tool »
- « ARTIST2 (ARTIST IS THE EUROPEAN NETWORK ON EMBEDDED SYSTEMS) WORKSHOP ON INTEGRATED MODULAR AVIONICS (IMA) »
- « OSEK NM »
- « scheduling » (2)
- « ada as a real time programming language » (2)
- « cervin scheduler stability » (2)
- « ARTIST Embedded research » (2)
- « embedded control matlab » (2)
- « castness »
- « rtss 2008 »
- « artist2 »
- « avionics »
- « ISSS CODES 2008 »
- « jpra architects »
- « ISO/IEC TR 18037 »

- « Francky Catthoor »
- « ARTEMIS European Technology Platform »
- « ARTIST2 »
- « speeds project verimag »
- « jacques pulou caspi »
- « Mathai Joseph »
- « embedded systems artist »
- « artist2 » (2)
- « artist » (2)
- « rtss 2008 » (2)
- « postgraduate study in embedded » (2)
- « RTES UML » (2)
- « t » (2)
- « multiprocessor uppaal » (2)
- « cluster testing »
- « RTSS 2008 »
- « rtcsa 2008 »
- « artist 2 »
- « UML tutorials embedded systems »
- « dario distefano »
- « IMA 2007 ROMA »
- « perez tijero »
- « atmel mega8 "operating system" »
- « RTCSA 2008 »
- « slides on software development process in an embedded system »
- « Embeded System Design TextBook »
- « automotive embedded system education »
- « posix timed event »
- « embeded based industrial projects »
- « UML&AADL'2008 »
- « real-time and QoS aspects at Thales »
- « dac 2008 »
- « partikle time »
- « .mpeg flexibility and dependability at management work »
- « artist mailing list »
- « CODES ISSS 2008 »
- « manfred broy »
- « rt-ep universidad madrid »
- « Embedded system design Peter Marwedel »
- « embedded scheduler car example »
- « ARTIST Noe »
- « common operating machine processing used in technical educational research »
- « artist2 ima »
- « artist2 ima workshop »
- « site:www.artist-embedded.org artist2 »
- « embedded systems in europe »
- « francky catthoor »
- « ARTIST2 Meeting on IMA »
- « winter school embedded system »
- « what is real time component »
- « rainer leupers »
- « possible solution allowing inter-task »
- « ISO/IEC TR 18037:2004 »
- « ARTIST »
- « Suzhou Chinese Academy »
- « korea Conference Systems »
- « artist2 ima »
- « artist »
- « state of the art in uml »
- « simulink materials »
- « hands-on tutorial on processor architecture and software optimization »
- « timing modelling »
- « resource sharing in real time systems »
- « t »
- « ARTIST Embedded system »
- « Embedded Systems In Industrial Automation »
- « design applications greece »
- « technia illustrator integration »
- « UML profile fault tolerance quality of service »
- « what is the main aim of schools? »
- « integrated modular avionics »
- « ist artist2 »
- « first mouse desin »
- « Paulo Pedreiras »
- « marte profile rhapsody »
- « A Preliminary Approach to Feedback Control of Server-based Real-Time Systems »
- « communication system PhD open positions »
- « denmark phd »
- « vienna kopetz GENESYS »
- « "summer school" 2008 embedded real time »
- « Agile implementation course material »
- « uml&aadl 2008 »
- « Intel Germany Research Center GmbH »
- « cordie 06 »
- « artist noe »
- « pat achievement tool »
- « codesign developers in greece »
- « lothar thiele »
- « why testing verification »

- « postdoc position »
- « "European Network of Excellence on" »
- « Integrated Modular Avionic roma »
- « control server A computational model for real-time control tasks »
- « Francky catthoor »
- « Sandro Etalle »
- « UML&AADL »
- « IRIT modeling environment »
- « postdoc middleware »
- « PT INOVAÇÃO aveiro JOAQUIM FERREIRA »
- « ARTIST UML & AADL 2008 »
- « autosar model »
- « volvo coelingh »
- « Bruno Bouyssounouse »
- « four a racu »

6.3 Full Structure

The structure of the Artist2 web site at the end of Year 3 is as follows (visible on the Site Map: http://www.artist-embedded.org/artist/spip.php?page=plan). The links below are active.

About the Artist2 NoE

- **Strategic Objectives**
- **Approach**
- **Joint Programme of Activities (JPA)**
- **Core Partners**
- **Workshops**
- **Workshops and Conferences**
- **Education**
  - Educational Methods for Embedded Systems Design
  - Events and Publications on Specific Topics
- **International Collaboration**
- **Contributions to Standards**
- **State of the Art**
- **Related Projects**
- **Becoming an Affiliated Partner**
- **Site Map**

Participants

- **Strategic Management Board**
- **Core Partners**

Research and Integration

Dissemination

- LCTES'07
- Dagstuhl: Geometry in Sensor Networks
- Dagstuhl: Mobile Interfaces Meet Cognitive Technologies
- Dagstuhl: Tools for the Model-based Development of Certifiable, Dependable Systems
- Dagstuhl: Model-Based Engineering of Embedded Real-Time Systems
- Dagstuhl: Formal Protocol Verification Applied
- FCC 2007
- ARTIST WS: Tool Platforms for ES Modelling, Analysis and Validation
- WCET'07
- Between Control and Software (in honor of Paul Caspi)
- Synchron 2007
- Precise Behavioral Semantics for DSML
- WESE'07: WS on Embedded Systems Education
- Foundations of Component-based Design
- 2nd Int'l ARTIST Workshop on Control for Embedded Systems
- Workshops and Seminars in 2006
  - CORDIE'06: Concurrency, Real-Time and Distribution in Eiffel–like Languages
  - Artist2 - Foundations and Applications of Component-based Design
  - MARTES 2006
  - JTRES 2006
  - WESE'06 - Embedded Systems Education
  - ARTIST2 Workshop on Timing Analysis in the Industrial Development Process (ISoLA 2006)
  - MoCC - Models of Computation and Communication
  - ARTIST2 Workshop on Requirements for Flexible Scheduling in Complex Embedded Systems
  - ARTIST2 Workshop on Specification and Verification of Secure Embedded Systems
  - ARTIST2 Workshop Beyond AutoSar
  - ARTIST Workshop at DATE'06
  - ARTIST2 Workshop on Execution Platforms / Cluster Meeting
  - ARTIST2 Workshop on Basic Concepts in Mobile Embedded Systems
  - Synchron 2006
  - ATVA China 2006
  - ATVA China 2006
- Workshops and Seminars in 2005
  - ACM-IEEE MEMOCODE'2005
  - Workshop: Distributed Embedded Systems
  - WESE'05 - ARTIST2 Workshop on Embedded Systems Education
  - OSPERT 2005
  - ARTIST Seminar on Adaptive Real-Time Systems
  - ARTIST Workshop at DATE'05
  - HSCC '05 - Hybrid Systems: Computation and Control
  - First S.Ha.R.K. Workshop
  - EU/US: Component-based Engineering for Embedded Systems
  - IST/NSF: Transatlantic Research Agenda on Future Challenges in Embedded Systems Design
  - 31st EUROMICRO Conference - Special session: Model Driven Engineering (MDE)

- **Past Workshops**
- **Schools and Seminars**

    - ADSD 2006: Advanced Digital Systems Design
    - First European Laboratory on Real-Time and Control for Embedded Systems
    - First European-SouthAmerican School for Embedded Systems
        - First European-SouthAmerican School for Embedded Systems - Programme
    - FOSAD 2006: 6th International School on Foundations of Security Analysis and Design
    - ARTIST2 - MOTIVES 2007
        - Social Event
    - ARTIST2 / UNU-IIST Spring School in China 2006
    - ARTIST2 Graduate Course on Embedded Control Systems
    - ARTIST2 Summer School 2005
    - Artist2 / UNU-IIST School in China - 2007
    - MDD4DRES
    - CASTNESS'07 Workshop and School
    - Quantitative Aspects of Embedded Systems
    - FOSAD 2007
    - ARTIST2 Graduate Course on Embedded Control Systems
    - Real-Time Microcontroller Systems: OSEK Standard and experiments on µcontroller devices
    - EPSD 2007
    - ARTIST2 PhD Course on: Automated Formal Methods for Embedded Systems
    - LASER Summer School on Software Engineering
- **International Collaboration**
- **Publications**
- **Contributions to Standards**
    - Modelling
    - Programming Languages
    - Operating Systems and Middleware
- **Course Materials Available Online**

Embedded System Links

- **Journals**
- **Conferences**
    - MEMOCODE 2007
    - EmSoft'07
    - DAC 2007
    - DATE 2007
    - RTAS 2008
    - CODES+ISSS 2006
    - IST Event 2006
    - RTSS 2006
    - FM 2006
    - CASES 2007
    - ASP-DAC 2008
    - HSCC'07
    - ARCS 2007
    - ECRTS 2007
    - IESS'07
    - ECMDA

    - ESEC/FSE
    - ECC
    - FDL'07
    - CAV 2007
    - SAMOS VII
    - RTSS 2007
    - ETFA 2007
    - RTS 2007
    - Networks-on-Chip Symposium
    - RTNS'2007
    - FORMATS'07
    - Embedded Systems Week 2007
    - Embedded Systems Conference 2007
    - RTCSA 2007
    - CODES-ISSS 2007
- **Hot Topics**
- **Standards**
- **Tools and Platforms**
    - Real-Time Components
    - Adaptive Real-Time
    - Compilers and Timing Analysis
    - Control for Embedded Systems
    - Testing and Verification
- **Main Projects**
    - ARTEMIS European Technology Platform
- **Position Papers**
- **Roadmaps**
- **Newsletters and Magazines**
- **Mainstream Press**
- **Announcements**
    - Artist Mailing List
    - Open Positions in Embedded Systems
    - Other Calls
    - Other
- **Publications**

intranet

7. Industrial Liaison

Artist2 has a wide array of affiliated industrial and SME partners. Most of these partners have participated in some way in the Artist2 technical meetings and the overall effort. There is strong, high-level industry participation through the various Spreading Excellence events organised by Artist2.

Our active involvement in the European Technology Platform ARTEMIS also could have a significant and long-term impact. Several Artist2 partners, including OFFIS, PARADES, VERIMAG; and TU Vienna, are actively involved in the ARTEMIS ETP, in particular leadership and active contribution to the Working Groups for the Strategic Research Agenda (SRA).

In addition, each Artist2 partner has an outstanding track record for interaction with industry. Globally, the Artist2 consortium has a very strong impact on European R&D in embedded systems, through participation in the three main Integrated Projects: DECOS, ASSERT, and RUNES. This impact is visible via the achievements in these Integrated Projects, related to time-triggered architectures and modelling and validation at the architectural level.

We believe that the strong involvement of four main Artist2 partners in the recently accepted SPEEDS Integrated Project will also have a very positive impact on progress in the state of the art, in component-based embedded systems engineering.

Here is a non-exhaustive list of highlights of Artist2 impacts on industry in Year 3. It is completed by information in the cluster and activity deliverables.

Real Time Components Interaction with Industry

The cluster activities are relevant for industrial sectors in which a major challenge is the need for mastering system integration of complex heterogeneous embedded systems. Several activities focus particularly on the transporation sectors, including the automotive and aeronautics sectors. Our society at large depends on the transportation sector to meet the increased demands on mobility required for achieving sustained economic growth. Relative to year 2000, ERTRAC, the European Road Transport Research Advisory Council[1], expects a 32 % increase in individual demand for travel by 2020, and a 38 % increase in goods transport by 2010. ACARE, the Advisory Council for Aeronautics Research in Europe[2], expects a three fold traffic density by 2020 for civil aircrafts. ERRAC, the European Rail Research Advisory Council[3] projects for 2020, that overall transport demand will have grown by 40 % for passengers to 7500 billion passenger-kms and 70 % for freight to 6000 billion ton-kms.

This increase in mobility must not decrease the level of safety achieved today. Expressed in terms of fatal accidents per 100 million person-kms, there was 2003 a 0.7 risk level when driving in cars whilst both flying and using trains is 20 times less risky. Within the automotive domain, we have seen in the last three decades a 50 % reduction of fatal accidents and an 80 % reduction of risk for fatal accident per person-km. The European commission has launched the eSafety Initiative and the Intelligent Car Initiative to assure a further 50 % reduction of road accidents by 2010 and a 70 % reduction by 2020.

[1] http://www.ertrac.org

[2] http://www.acare4europe.com

[3] http://www.errac.com

A key enabling technology to achieve these objectives are embedded systems, that is hardware-software systems realizing key functions for vehicles and vehicle coordination in all three transportation domains, as elaborated below for the automotive domain. Examples of current technological shifts in the domains are briefly indicated below.

- **Aeronautics:** This sector is faced with the challenge of Integrated Modular Avionics (IMA), which drastically changes the OEM/supplier relations. Integration will occur at the level of functions, not any more at the level of packaged hardware modules and devices. Therefore, OEMs are faced with the need of mastering system integration at all levels of the design process (from requirements to hardware). This move will drastically impact how certification will be performed in the future.
- **Automobile:** The move is similar to that in aeronautics, the changes being in fact much more rapid and drastic – within a few years, the OEM/supplier chain will be entirely reconfigured. Added value, for OEMs, will move to completely different components of the car, namely those mostly contributing to building the "concept" and "personality" of each different car. Sharing platforms with competitors is now the trend, as shown by the **Autosar**[4] initiative. . The quest for value added will create stress in the supply chain as Tier 1 suppliers will position themselves as essential providers of electronic content while OEMs will take the lead in extracting value from integration and product conception from mechanical components all the way to software components.
- The **railway sector** shares an increasing reliance on embedded software as well as growth rates with the automotive and avionics sectors. To enhance train based transportation in Europe, the European Commission under TSI Interoperability Directive 96/48/EC and 2001/16/EC is requiring its member states to adhere to the European standard on Rail Traffic Management/ European Train Control Systems (ERTMS/ETCS) guaranteeing interoperability of safety related electronic train components together with a migration road map defining different levels of functionality. At the highest ETCS level, the overall task of collision avoidance between trains while maintaining (as secondary objective) a smooth flow of trains is realized through a complex interplay between the interlocking system and on-board components, using so-called RadioBlockCenter (RBC) Units as interface

ART Cluster Interaction with the consumer electronics industry

- The ART cluster is continuing a strong collaboration with three major companies, Philips, NXP and Ericsson, acting in the domain of consumer electronics. After a tight interaction with the engineers responsible for the software development process, a number of industrial needs have been identified, that would make new generation products more robust and flexible.

  The expertize existing in the ART cluster on overload management is of high interest for these companies, since it allows building flexible as well as predictable real-time systems that can react to load changes and perform QoS adaptation in a controlled fashion.

  A meeting with Philips and NXP researchers has been organized in Pisa at the Scuola Superiore Sant'Anna on February 14, 2007.

[4] http://www.autosar.org

Ericsson is collaborating with SSSA, TUKL and Evidence in a joint European project, called ACTORS, which will cover issues on real-time and control issues for implementing adaptive real-time systems.

TUKL has been working closely with NXP (formerly Philips) on integrated resource management for adaptive real-time systems and temporal constraints of media processing. It has been carried out on individual basis and via a joint PhD student. A workshop to bring together engineers and scientist will be organized jointly.

ART Cluster Interaction with the electronics industry

- The ART cluster (SSSA, Pavia, and Evidence) is collaborating with Microchip Technology in the development of real-time embedded platforms for monitoring and control. In particular, the expertize existing in the ART cluster on real-time embedded control applications and real-time operating systems is extremely attractive for Microchip, who is interested in pushing the development of real-time embedded applications using 16-bit microcontrollers (as the dsPIC30 and the dsPIC33).

  A small real-time embedded platform (FLEX) for sensory acquisition and motor control has been defined to be used (in conjunction with a wireless card) as a node of a mobile wireless network. This unit would be more powerful and flexible than a mote and could be used to carry out experiments on sensor networks, embedded control, mobile robot teams and distributed control systems.

  FLEX web site: http://www.evidence.eu.com/content/view/114/204/

  Technology from AbsInt (Timing Analysis activity) is used by Airbus and the Critical Systems industry (see http://www.absint.com/refs.htm).

Compilers and Timing Analysis Interaction with Industry

Timing-Analysis tools have recently entered industrial practice and are in routine use in the aeronautics and automotive industry. AbsInt's timing-anlysis tool, aiT, has been used in the certification of time-critical subsystems of the Airbus A380 and has thus acquired the status of a *validated* tool.

All sectors concerned with Embedded Systems need Compilation Technology, WCET estimations are relevant for all industrial sections using hard real-time systems. Therefore, industrial sectors in this case include avionics, automotive, defence and some areas where control systems are applied. Especially in the automotive and the aeronautical domains, there is a need to have precise knowledge on the worst-case timing behaviour of safety critical software. This need is underlined by the fact that the worst-case timing of large parts of the software used within the new Airbus A380 has been analyzed using AbsInt's aiT.

Both the aeronautics and the automotive industries follow a similar trend to integrated architectures, aeronautics to IMA (Integrated Modular Avionics), automotive to a component architecture developed by the AUTOSAR consortium. This transition at latest will require timing analysis as an integrated component in the development process.

However, only the availability of precise timing analyses does not fulfil industrial needs. Since the code of safety critical applications is typically generated by a compiler, the compiler should also be aware of worst-case timings. Currently, this is not the case leading to the unacceptable situation that, whenever it is detected that an application does not meet its real-time constraints, manual code transformation, recompilation and timing analysis need to be done repeatedly. The burden of timing analysis and optimization will be taken away from the human designer by the approach proposed at Dortmund.

- Tidorum is working with Thales Alenia Space and Rapita Systems Ltd in a continuation of the PEAL project for the European Space Agency. This project works on performance verification of cache-equipped processors in space systems, with particular reference to memory lay-out issues. There is no (public) web link for this work.
  Another minor interaction with industry concluded recently in the form of a master's thesis at Mälardalen University on the experimental application of Tidorum's timing-analysis tool Bound-T to a marine embedded application of CC Systems AB. But this should perhaps be classed as an academic, rather than industrial effort. The work is described at http://www.mdh.se/ide/eng/education/index.php?choice=show&lang=en&id=0628.
- At Dortmund, technology transfer is mostly performed through ICD e.V. (see http://www.icd.de), a local spin-off headed by Peter Marwedel. Customers of ICD's embedded systems group include Infineon, ELMOS and TÜV Nord (http://www.tuev-nord.de/english/index.asp). Contract work comprizes highly optimizing production quality compilers and complete software tool chains for embedded processors. Additional cooperation exists between the University of Dortmund and Thales Communications (within the research project MORE, see http://www.ist-more.org) and Nokia.
- MDH collaborates with AbsInt GmbH, Tidorum Ltd, Arcticus Systems, CC-Systems AB, IAR Systems, and Volvo CE regarding case studies evaluating WCET analysis tools (see http://www.mrtc.mdh.se/projects/wcet/partners.html). MDH is also coordinator of the EU FP7 project ALL-TIMES which involves the companies AbsInt GmbH, Rapitasystems Ltd, Symtavision GmbH, and Gliwa GmbH.

Execution Platforms **Interaction with Industry**

Automotive Industry

The automotive industry is currently in a fast and spectacular evolution towards the intelligent, safe, environmental, interconnected, and economic car. Electronics is at the basis of most of this development. New features such as automatic intelligent parking assist, blind-spot information system, navigation computers with real-time traffic updates, car-to-car communication, not to mention electronically controlled brakes or electronic power steering, are out and running in most recent high-end cars. This development is going to continue with new functionality being adopted not only in premium cars but also in the mass-market. Consequently, estimates are that up to 80% of the innovations are directly dependent on embedded systems. This, of course, comes at a cost. Automotive electronics, currently accounts for 22% of a vehicle's cost and is predicted to increase to 40% by 2010 (www.altera.com).

This evolution brings a series of challenges in all steps of the development cycle. How to specify and model such a complex system? There is a need for a component based modelling, analysis, and synthesis approach in which independently designed hardware and software components can safely be combined into a working system. How to achieve the ever increasing demand on functionality and safety, at an affordable cost? Modern automotive electronic systems are highly distributed networks with components interacting over various infrastructures. How to achieve a safe and predictable system at such a huge level of complexity and heterogeneity? A well defined methodology is needed for mapping the complex functionalities on predefined distributed automotive platforms. This assumes well defined standards, middleware layers, analysis tools, software generation tools, design exploration and optimisation approaches.

Due to ARTIST2 activities, (e.g. the ARTIST workshop “Beyon AUTOSAR” in Innsbruck) several technical meetings between TU Braunschweig and leading automotive suppliers in the AUTOSAR context held place. As a main topic it was discussed how compositional performance verification methods can be utilized in the automotive design process to facilitate the network integration problem. TU Braunschweig was invited to the SAE world congress 2007 in Detroit to present recent results in compositional performance verification. In addition, in cooperation with Daimler, the ESI actively participated in defining the Artemis research agenda in this area.

Mechatronic Industry

Traditionally, the development of mechatronic systems was a rather sequential process. First the mechanical part was designed, next the hardware infrastructure was fixed, and finally the embedded software was developed. Typically, this leads to many proplems at systems engineering, because only then the interference of design decisions from the disciples became visible. To improve this process and to shorten the time-to-market, there is a clear trend towards concurrent engineering. To be able to detect problems earlier in the development cycle, there a strong need for high-level models allowing early analysis of system-level design decisions. Moreover, there is an increasing interest in the use of models to improve the early testing process; for instance, one would like to test the embedded software before its environment is available.

Concerning the execution platforms used, one can observe the need for a flexible process where one can easily switch between various solutions, such as the amount of distribution, the topology used, the communication infrastructure, and the operating system. Often in a first release of a high-tech system the execution platform is overdimensioned. For instance, one might choose a highly distributed architecture to avoid scheduling problems. In a later version, a strong cost reduction has to be achieved by combining more functionality on a single node. One major problem is to foresee at an early stage of the design whether a particular hardware platform is feasible for a given software system. Hence there is a strong need for methods that can help engineers to make a well-founded choice for an execution platform.

An increasing interest in the application of model-driven design techniques can be observed. These techniques emphasize the explicit separation between the application logic and the execution platform and allow models to be analyzed and systemically refined through model transformations.

Information Technology

Microelectronic technology is continuing to grow according to Moore's law. However, the need for computation power in industry is growing even faster. This is the case with traditional areas such as technical/scientific computation, and, more recently, modern applications, for instance interactive multimedia, high bandwidth communication, or speech recognition. Many of these applications are running on mobile computer, which makes issues even more complicated: an unprecedented amount of computation power has to be delivered with very low energy consumption. So, instead of just running after high performance, industry is out after a good performance - energy product. These unprecedented performance/energy requirements cannot be achieved by further pushing processor technology along the traditional Pentium lines. New architectures are needed in which several lower performance (and less energy hungry) computation nodes are cooperating in order to globally achieve the expected performance. Modern MPSoC and NoC architectures are developed along these lines.

Another clear trend is towards reconfigurable architectures, in general, and configurable processors, in particular. The generic goal is to achieve a high degree of flexibility (traditionally available only with software implementation) at a power consumption which is much lower than achievable with a traditional software implementation using general purpose processors.

The emerging trend for multimedia applications on mobile terminals, combined with a decreasing time-to-market and a multitude of standards have created the need for flexible and scalable computing platforms that are capable of providing considerable (application specific) computational performance at a low cost and a low energy budget.

Hence, in recent years, the first multiprocessor System-on-Chip components have emerged (like e.g. TI OMAP, ST Nomadik, Philips Nexperia, IBM/Toshiba/Sonys CELL). These platforms contain multiple heterogeneous, flexible processing elements, a memory hierarchy and I/O components. All these components are linked to each other by a flexible on-chip interconnect structure. These architectures meet the performance needs of multimedia applications, while limiting the power consumption.

To effectively utilize these emerging technologies, new design methodologies are being developed. This includes application and architecture modelling, mapping but especially also design-space exploration techniques that aid in finding optimal trade-offs.

***Control for Embedded Systems* Interaction with Industry**

Embedded control systems are vital in most industrial application areas, e.g., automotive, avionics, manufacturing, and automation. In many areas it is the quality and performance of the control systems that distinguishes a product or company. Therefore implementation techniques for embedded control systems that are resource-efficient and give good performance are very important. There is still a debate whether control systems best are implemented using time-triggered approaches or whether a more event-based implementation is sufficient. This is something that varies from industry sector to industry sector, and which also depends on the level of safety required and the need for formal guarantees.

The use of feedback-based (adaptive) resource management is of particular interest for soft real-time applications, e.g., multimedia applications within consumer electronics systems. The main applications of control of computer systems can be found at companies like IBM or HP. However, also large users of server technology such as Amazon have in-house application development within this area

The introduction of multicore platforms also in embedded applications creates new design challenges. A particular problem compared to uniprocessor platforms is the WCET analysis. Due to the shared memory access WCET analysis runs the risk of being very conservative. This will most likely hamper the applicaton of hard real-time techniques based on static analysis. Hence, the market for more dynamic or adaptive resource reservation based on feedback from the true resource utilization and/or the application quality-of-service can be expected to increase in the future.

Testing and Verification Interaction with Industry

The testing and verification techniques and tools developed and disseminated within the cluster have relevance and potential impact on literally *all* industrial sectors developing or using embedded systems solutions. Within the Strategic Research Agenda of the ARTEMIS research platform[5] *Design Methods and Tools* is one of the three research priorities put forward. Here model- and component-based approaches are proposed as necessary for coping with the growing complexity of systems while meeting "time-to-market" requirements. Methods and tools for testing and verification are to play a central role in the ARTEMIS research strategy, as can be seen from the following citations:

- ".. methods and tools for simulation, automatic validation and proving, and virtual Verification and Validation (V&V). Methods and tools for developing product lines of embedded systems."
- ".. reduce the cost of the system design by 50%. Matured product family technologies will enable a much higher degree of strategic reuse of all artifacts, while component technology will permit predictable assembly of Embedded Systems."
- ".. achieve 50% reduction in development cycles. Design excellence will aim to reach a goal of "right first time, every time" by 2016, including Validation, Verification and certification (to the same and higher standards as today)."
- "..manage a complexity increase of 100% with 20% effort reduction. The capability to manage uncertainty in the design process and to maintain independent hardware and software upgradeability all along the life cycle will be crucial."
- ".. reduce by 50% the effort and time required for re-validation and recertification after change, so that they are linearly related to the changes in functionality."

The industrial needs for improved tools and methods for system validation have also been witnessed by a number of industrial and industry inspired case-studies and projects using model-based testing and verification carried out by the individual partners. Detailed information of these (and others) is to be found in the ARTIST2 Open Repository for Test and Verification Case Studies (https://bugsy.grid.aau.dk/artist2) and include:

- Danfoss (Aalborg): The continuation (From February 2006, to approx. January 2007) emphasizes automated testing. The project has two main goals. One is to develop an automated test execution environment for system level testing of the EKC series refrigeration controllers. The other is to improve model-based online testing given the experiences from the first trials
- Ericsson Telebit (Aalborg): The goal of this project has been to use Live Sequence Charts in a model-driven approach to the testing of TCP/IP internet protocols. Live Sequence Charts are used to capture (informal) RFC in a formal, yet intuitive, way.
- TK Systemtest (Aalborg): From timed automata design models the verification engine of UPPAAL is used for off-line generation of test-sequences which covers the model. In

[5] http://www.artemis-office.org/

the project a tool for translating these logical test-sequences to test-scripts executable in QTP of Mercury's Test Director. The resulting tool-chain has been applied to automatic testing of web-services of TDC (Danish Telecom). A commercial spin-off tool (V+) is under development.

- Skov A/S (Aalborg): In this work, we provide a complete tool chain for automatic controller synthesis using UPPAAL Tiga and Simulink. The tool chain is explored using an industrial case study for climate control in a pig stable. The problem is modelled as a game, and UPPAAL Tiga is used to automatically synthesize a safe strategy that is transformed for input to Simulink, ´which is used to run simulations on the controller and generate code that can be executed in the actual pig stable. The models allow for guiding the synthesis process and generate different strategies that are compared through simulations.
- ESI (Embedded Systems Institute, Eindhoven) has carried out (is carrying out) large industrial case studies with Océ, ASML, Philips Semiconductors (now NXP), Philips Medical Systems, Vanderlande Industries.
- Uppsala University: As a case study, we have developed a formal model for a Biomedical Sensor Network (BSN). The sensor nodes of the network are constructed based on the IEEE 802.15.4 Zig-Bee standard for wireless communication. The UPPAAL tool is used to tune and validate the temporal configuration parameters of the network in order to guarantee the desired QoS properties for a medical application scenario. The case study shows that even though the main feature of UPPAAL is model checking, it is also a promising and competitive tool for efficient simulation.
- OFFIS, University of Freiburg, Aalborg University: The "Single-tracked Line Segment" (SLS) case study stems from an industrial partner of the UniForM-project . It is the specification of a control system for a single-tracked line segment for tramways. It is implemented by distributed PLC automata. We took three different models of the SLS case study as examples. As the safety property to verify, we chose the mutual exclusion of drive permissions, i.e., the control system never gives permission to both directions simultaneously.
- OFFIS; Univ. of Oldenburg; Albert-Ludwigs-Universität Freiburg; Max-Planck-Institut für Informatik: The flap controller (high-lift) case study is derived from a case study for Airbus, a controller for the flaps of an aircraft. The flaps are extended during take-off and landing to generate more lift at low velocity. They are not robust enough for high velocity, so they must be retracted for other periods. The controller can perform a load-relief function to correct the pilot's commands if he endangers the flaps. Additionally, there is also an extensive monitoring of the health of its sub-systems, checking for instance for hardware failures. Typically this will give rise to large discrete state spaces when model checking models derived from the flap controller.
- OFFIS, Univ. of Oldenburg : Automating verification of cooperation, control, and design in traffic applications. Here we present a verification methodology for cooperating traffic agents covering analysis of cooperation strategies, realization of strategies through control, and implementation of control. For each layer, we provide dedicated approaches to formal verification of safety and stability properties of the design. The range of employed verification techniques invoked to span this verification space includes application of pre-verified design patterns, automatic synthesis of Lyapunov functions, constraint generation for parameterized designs, model-checking in rich theories, and abstraction refinement. We illustrate this approach with a variant of the European Train Control System (ETCS), employing layer specific verification techniques to layer specific views of an ETCS design.

8. Staff Mobility and Artist Meetings

The strongest form of direct collaboration is through visits between core and affiliated participants, and through the internal Artist meetings.

Given the large volume of information, reporting for these is now done through the web portal intranet: http://www.artist-embedded.org/artist/-Reporting-.html

9. Joint Projects and Joint Proposals

The following projects are either ongoing at the end of Year 3, or under proposal.

Please note that this is a subset of the full list, as some proposals are confidential.

ACTORS - Adaptivity and Control of Resources in Embedded Systems
EU IST STREP
Starting Date: early 2008
Artist2 Partners:
- Scuola Superiore Sant'Anna (Italy)
- Technische Universität Kaiserslautern (Germany)
- Ecole Polytechnique Fédérale de Lausanne (Switzerland)
- Lunds Universitaet (Sweden)

Main other partners:
- Evidence Srl (Italy)

ALL-TIMES - Integrating European Timing Analysis Technology
EU IST STREP
Starting Date: early 2008
Artist2 Partners:
- Maelardalen University (Schweden)
- Technische Universität Wien (Austria)

Main other partners:
- Symtavision GmbH (Germany)
- AbsInt Angewandte Informatik GmbH (Germany)

COMBEST - COMponent-Based Embedded Systems design Techniques
EU IST STREP
Starting Date: early 2008
Artist2 Partners:
- UJF Filiale (France)
- Université Joseph Fourier Grenoble I (France)
- Ecole Polytechnique Fédérale de Lausanne (Switzerland)
- Swiss Federal Institut of Technology (Switzerland)
- Institut National de Recherche en Informatique et en Automatique (France)
- Offis e.V. (Germany)
- PARADES GEIE (Italy)

Main other partners:
- Technische Universität Carolo – Wilhelmina zu Braunschweig (Germany)
- EADS Deutschland GmbH (Germany)
- ISRAEL AEROSPACE INDUSTRIES LTD. (Israel)

PREDATOR - Design for Predictability and Efficiency
EU IST STREP
Starting Date: early 2008
Artist2 Partners:
- Universität des Saarlandes (Germany)
- Swiss Federal Institute of Technology Zurich (Switzerland)

- Universität Dortmund (Germany)
- Università di Bologna (Italy)
- Scuola Superiore Sant'Anna (Italy)

Main other partners:

- Absint Angewandte Informatik GmbH (Germany)
- Airbus France (France)
- Robert Bosch GmbH (Germany)

Quasimodo - Quantitative System Properties in Model-Driven Design of Embedded Systems
EU IST STREP
Starting Date: early 2008
Artist2 Partners:

- Aalborg University (Denmark)
- Centre National de la Recherche Scientifique (France)
- RWTH Aachen University (Germany)
- Universität des Saarlandes (Germany)

Main other partners:

- Université Libre de Bruxelles (Belgium)

Reconfigurable Ubiquitous Networked Embedded Systems (RUNES)
EU IST Integrated Project
Starting Date: 2004-09-01 (ended July 2007)
Artist2 Partners: LUND (Karl-Erik Årzén), KTH (Karl Henrik Johansson)
Main other partners: Ericsson (Andras Toth, coordinator)
http://www.ist-runes.org/

Hybrid Control (HYCON)
EU IST Network of Excellence
Starting Date: 2004-09-01
Artist2 Partners: LUND (Anders Rantzer), KTH (Karl Henrik Johansson), ETH (Manfred Morari), PARADES (Alberto Sangiovanni-Vincentelli), Univ Twente (Edgar Brinksma), INRIA (Giancarlo Ferrari Trecate)
Main other partners: CNRS (Francois Lamnabhi-Laguerrigue, coordinator)
http://www.ist-hycon.org/

Advancing Traffic Efficiency and Safety through Software Technology (ATESST)
EU IST STREP
Starting Date: 2006-01-01
Artist2 Partners: KTH (Martin Törngren), CEA (Sebastien Gerard, Francois Terrier), Volvo Technology (coordinator - affiliated partner of ARTIST2), Daimler Chrysler (affiliated partner), ETAS (affiliated partner)
Main other partners: Technical University of Berlin, Mentor Graphics, Siemens-VDO
http://www.atesst.org/

Dynamically Self-Configuring Automotive Systems (DYSCAS)
EU IST STREP
Starting Date: 2006-01-06
Artist2 Partners: KTH (Martin Törngren), Volvo Technology (coordinator - affiliated partner of ARTIST2), Daimler Chrysler (affiliated partner of ARTIST2)

Main other partners: Enea Embedded Technology AB, Robert Bosch GmbH, University of Greenwich, University of Paderborn, Systemite AB, Movimento AB
http://dyscas.org/

Safety critical vehicular systems (SAVE++)
National Swedish project funded by the Swedish Foundation for Strategic Research
Starting Date: 2006-01-01
Artist2 Partners: KTH (Martin Törngren), UU (Wang Yi, Paul Pettersson), MDH (Hans Hansson, Ivica Crncovic), LIU (Simin Nadjm Tehrani)
http://www.ida.liu.se/~rtslab/projects.shtml#save++

SOCRADES
Service-oriented cross-layer infrastructure for distributed smart embedded devices
Integrated Project, European Commission, IST program, FP6
Starting Date: 2006-06-01
Artist2 Partners: KTH (Karl-Henrik Johansson, Mikael Johansson), ABB
http://www.socrades.eu/

EUROSYSLIB - European Leadership in System Modelling and Simulation through advanced MODELICA Libraries,
ITEA2 Project proposal under submission
Starting Date: Not yet accepted
Artist2 Partners: LUND (Karl-Erik Årzén, Anders Rantzer), INRIA (Ramine Nikoukhah)
Main other partners: Dassault Systèmes, DLR, EDF, Siemens

Reservation-Based Scheduling in Mobile Terminals
National Swedish proposal under preparation
Starting Date: Not yet accepted
Artist2 Partners: Ericsson (Johan Eker), LUND (Karl-Erik Årzén, Anton Cervin)
Main other partners: None

FRESCOR - Framework for Real-time Embedded Systems based on COntRacts,
EU IST STREP 034026
Starting Date: 1 June 2006
Artist2 Partners: Universidad de Cantabria (Michael Gonzalez Harbour), University of York (Alan Burns), Scuola Superiore Sant'Anna (Giorgio Buttazzo), Kaiserslautern Univ. of Tech. (Gerhard Fohler), Univ. Politécnica de Valencia (Alfons Crespo), Czech Tech. Univ. in Prague (Zdenek Hanzalek), ENEA
Main other partners: Thales Communications, EVIDENCE
http://www.frescor.org/

SAVE
A Swedish project, supported by the Foundation for Strategic Research, with partners: Uppsala, Mälardalen, KTH, Linköping. The goal of SAVE is to establish an engineering discipline for systematic development of component-based software for safety critical embedded systems.

SPEEDS
a concerted effort to define the new generation of end-to-end methodologies, processes and supporting tools for safety-critical embedded system design.
Artist2 Partners: Verimag, OFFIS, PARADES, INRIA
http://www.speeds.eu.com/

Execution Time Analysis of Time-Critical Embedded Software
Swedish national funding (KK-foundation), 2006-2008
Keywords: WCET analysis
ARTIST2 participation: Malardalen, Tidorum, AbsInt
http://www.mrtc.mdh.se/projects/wcet/

PROGRESS Strategic Centre
Swedish national funding (Swedish Foundation for Strategic Research), 2006-2010, research centre with timing analysis of component-based embedded software as one activity
Keywords: WCET analysis, Component-based embedded software
ARTIST2 participation: Malardalen
http://www.mrtc.mdh.se/progress/

10. Affiliated Partners in the ARTIST2 Research Activities

ARTIST2 has a very extended family, through its affiliated industrial, SME, academic and international collaboration partners. These are one of our main operational links for concretely spreading excellence outside the Network of Excellence. The affiliated partners have strong relations with the consortium, and they contribute actively to and fully benefit from the NoEs results.

Affiliated partners are not core members in the consortium, but receive support for travelling to Artist2 meetings, and actively contribute to the implementation of the Joint Programme of Activities (JPA). These affiliated partners include industrial, SME, academic, and international affiliates.

At the end of Year 3, the NoE has 23 large industrial affiliated partners, 10 SMEs, 37 academic, and 17 international affiliated partners. All of these partners have participated in one or more of our technical events and work over the course of the Years 1-3. We have also had a very large number of participants from the wider research and industrial communities, who are not listed officially.

As planned, the Artist2 consortium will continue to increase its affiliated partners. The procedure for joining Artist2 as affiliated partners is described here:
http://www.artist-embedded.org/artist/Becoming-an-Affiliated-Partner.html

Full information about participation by the Artist2 affiliated partners in the Artist2 activities is provided in the activity deliverables.

Affiliated Industrial Partners

The complete set of Affiliated Industrial partners, including web links, is available online, here:
http://www.artist-embedded.org/artist/-Affiliated-Industrial-Partners-.html

Christer Norström
Göran Arinder

Peter Mårtensson

David Lesens

Astrium Space (EADS)

Dirk Ziegenbein

Robert Bosch AG

Thomas Thurner
Matthias Grochtmann

Sven Holme Sørensen

Dr Joachim Stroop

Roberto Zafalon

Alain Ourghanlian

Dr. Kai Richter

Jan Lindblad

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11. Joint Papers

Joint publications reflect deep and lasting integration between participants, while at the same time spreading the results to the wider research community.

11.1 Real-Time Components

[ÅCF+07] M. Åkerholm, J. Carlson, J. Fredriksson, H. Hansson, J. Håkansson , A. Möller, P. Pettersson, M. Tivoli, “The SAVE approach to component-based development of vehicular systemsJournal of Systems and Software, vol 80, nr 5, p655-667, Elsevier, May, 2007

[BBCP06] E. Badouel, A. Benveniste, B. Caillaud, and R. Passerone. Heterogeneous rich component definition, mathematical semantics. SPEEDS deliverable D2.1b/sem, annex of deliverable D2.1b, December 2006.

[BCC+06] A. Benveniste, B. Caillaud, L.P. Carloni, P. Caspi, A.L. Sangiovanni-Vincentelli and S. Tripakis, “Communication by Sampling in Time-Sensitive Distributed Systems.” in Proceedings of the Sixth International Conference on Embedded Software (EMSOFT), Seoul, Korea, October, 2006.

[BCSM07] M. Bozga, O. Constant, M. Skipper, and Q. Ma. SPEEDS meta-model syntax and static semantics. SPEEDS deliverable D2.1a, January 2007.

[CMM+07] Olivier Constant, Qin Ma, Lionel Morel, Mark Skipper, and Sofronis Christos. L-1 hrc meta-model, 1st version (1st round). SPEEDS Deliverable D2.1.d, August 2007.

[BJR] T. Berg, B. Jonsson, and H. Raffelt: Regular Inference for State Machines with Equality tests. In preparation

[GHIKS06] A. Ghosal, T. A. Henzinger, D. Iercan, C. M. Kirsch, and A. Sangiovanni-Vincentelli. “A hierarchical coordination language for interacting real-time tasks.” Proceedings of the Sixth Annual Conference on Embedded Software (EMSOFT), ACM Press, 2006, pp. 132-141.

[HP07] J. Håkansson , A. Möller, P. Pettersson, “Partial Order Reduction for Verification of Real-Time Components.” Proceedings of the 5th International Conference on Formal Modelling and Analysis of Timed Systems, LNCS 4763, p 211-226, Springer Verlag, October, 2007.

[HS06] T. A. Henzinger and J. Sifakis. “The embedded systems design challenge.” Proceedings of the 14th International Symposium on Formal Methods (FM), Lecture Notes in Computer Science 4085, Springer, 2006, pp. 1-15.

M. Faugère (Thales), T. Bourbeau (Thales), R. de Simone (INRIA) and S. Gérard (CEA), “MARTE: Also an UML Profile for Modeling AADL Applications”, In proceeding of ICECCS 2007, IEEE Computer Society, New Zealand, July 2007.

Philippe Cuenot, DeJiu Chen, Sébastien Gérard, Henrik Lönn, Mark-Oliver Reiser, David Servat, Ramin Tavakoli Kolagari, Carl-Johan Sjöstedt, Martin Törngren, Matthias Weber. Managing Complexity of Automotive Electronics Using the EAST-ADL. In Proc. of the 2nd Int. UML&AADL Workshop (UML&AADL'2007) at the 12th Int. Conf. On Engineering of Complex Computer Systems, Auckland, New Zealand, July 11 - 14, 2007.

Philippe Cuenot, DeJiu Chen, Sébastien Gérard, Henrik Lönn, Mark-Oliver Reiser, David Servat, Ramin Tavakoli Kolagari, Martin Törngren, Matthias Weber. Improving Dependability by Using an Architecture Description Language. Accepted book chapter contribution for the forthcoming book Architecting Dependable Systems IV. Editors: Rogerio de Lemos, Cristina Gacek, Alexander Romanovsky. Springer series: Lecture Notes in Computer Science, Vol .4615, 2007. ISBD 978-3-540-74033-9.

[BMP+07] A. Basu, L. Mounier, M. Poulhiès, J. Pulou and J. Sifakis Using BIP for Modeling and Verification of Networked Systems - A Case Study on TinyOS-based Networks 6th IEEE Int. Symp. on Network Computing and Applications (NCA 2007), July 2007, Cambridge, MA, USA.

[BCSM07] M. Bozga, O. Constant, M. Skipper, and Q. Ma. SPEEDS meta-model syntax and static semantics. SPEEDS deliverable D2.1d, July 2007.

[CGM07] O. Constant, W. Monin, S. Graf "From Complex UML Models to Systematic Performance Simulation with Persiform". Verimag Research Report no TR-2007-10, submitted for publication

[GGM+07a] Gregor Gössler, Susanne Graf, Mila Majster-Cederbaum, M. Martens, and Joseph Sifakis. An approach to modeling and verification of component based systems. In Current Trends in Theory and Practice of Computer Science, SOFSEM'07, number 4362 in LNCS, 2007.

[GGM+07] Gregor Gössler, Susanne Graf, Mila Majster-Cederbaum, M. Martens, Joseph Sifakis, Ensuring Properties of Interaction Systems by Construction. In Program Analysis and Compilation, Theory and Practice, number 4444 in LNCS, 2007.

[GGH+06] Susanne Graf, Sébastien Gérard, Oystein Haugen, Iulian Ober, Bran Selic. MARTES - Modelling and Analysis of Real Time and Embedded Systems Using UML. In *MoDELS 2006 International Workshops, Doctoral Symposium, Educators Symposium; Genoa, October 2006, Revised Selected Papers* LNCS 4364, 2006

[HJR+07] N. Halbwachs, E. Jahier, P. Raymond, X. Nicollin, D. Lesens Virtual execution of AADL models via a translation into synchronous programs *Seventh International Conference on Embedded Software (EMSOFT 2007)*, Salzburg, Austria

[DB*07] M. Dohler, D. Barthel, F. Maraninchi, L. Mounier, S. Aubert, C. Dugas, A. Buhrig, F. Paugnat, M. Renaudin, A. Duda, M. Heusse and F. Valois. The ARESA Project: Facilitating Research, Development and Commercialization of WSNs' IEEE SECON'07 (4th IEEE Com. Soc. Conf. on Sensor, Mesh and Ad Hoc Communications and Networks), June 18-21, 2007, San Diego, CA, USA

[LTAG07a] Extending OCL to ensure model transformations. *François Lagarde, François Terrier, Charles André and Sébastien Gérard.* Foundations and Practices of UML, *November 2007. (*workshop of ER 2007*).*

[LTAG07b] Constraints modeling for (profiled) UML models.. *François Lagarde, François Terrier, Charles André and Sébastien Gérard. In European Conference on Model-Driven Architecture: Foundations and Applications 2007 (ECMDA 07), Haïfa, Israel, Juin 2007.*

[CCG+07a] *Philippe Cuenot, DeJiu Chen, Sébastien Gérard, Henrik Lönn, Mark-Oliver Reiser, David Servat, Carl-Johan Sjöstedt, Ramin Tavakoli Kolagari, Martin Törngren and Matthias Weber* Managing Complexity of Automotive Electronics Using the EAST-ADL. In Proc. of the 2nd Int. UML&AADL Workshop (UML&AADL'2007) at the 12th Int. Conf. On Engineering of Complex Computer Systems, Auckland, New Zealand, July 11 - 14, 2007...

[SCC+07] Carl-Johan Sjöstedt, De-Jiu Chen, Phillipe Cuenot, Patrick Frey, Rolf Johansson, Henrik Lönn, David Servat, Martin Törngren. Developing Dependable Automotive Embedded Systems using the EAST-ADL; representing continuous time systems in SysML. In Proc. of EOOLT'2007. 1st Int. Workshop on Equation-Based Object-Oriented Languages and Tools.

[STS+07] Jianlin Shi, Martin Törngren, David Servat, Carl-Johan Sjöstedt, DeJiu Chen, Henrik Lönn. Combined usage of UML and Simulink in the Design of Embedded Systems: Investigating Scenarios and Structural and Behavioral Mapping. To appear in OMER 4 workshop on Object-oriented modelling of embedded real-time systems, Oct. 30-31, 2007.

[CCG+07b] Philippe Cuenot, DeJiu Chen, Sébastien Gérard, Henrik Lönn, Mark-Oliver Reiser, David Servat, Ramin Tavakoli Kolagari, Martin Törngren, Matthias Weber. Improving Dependability by Using an Architecture Description Language. Accepted book chapter contribution for the forthcoming book Architecting Dependable Systems IV. Editors: Rogerio de Lemos, Cristina Gacek, Alexander Romanovsky. LNCS, Vol .4615, 2007.

[FBSG07] *Madeleine Faugère, Thimothée Bourbeau, Robert de Simone and Sébastien Gérard.* MARTE: Also an UML Profile for Modeling AADL Applications*.* iceccs*, 2007.*

[MFF+07] *Pierre-Alain Muller, Franck Fleurey, Frédéric Fondement, Michel Hassenforder, Rémi Schneckenburger, Sébastien Gérard and Jean-Marc Jézéquel.* Model-Driven Analysis and Synthesis of Concrete Syntax.*. In MoDELS, pages 98-110, 2006.*

[EDG+07] *Huascar Espinoza, Hubert Dubois, Sébastien Gérard, Julio Medina, Dorina C. Petriu, Murray Woodside.* Annotating UML Models with Non-Functional Properties for Quantitative Analysis*. In Satellite Events at the MoDELS 2005 International Workshop, Montego Bay, Jamaica, Revised Selected Papers, pages pp. 79 - 90. Springer, 2006. (*ISBN: 3-540-31780-5*).*

[TRGD07] An Open Framework for Hardware Detailed Modeling*. S . Taha, A . Radermacher, S . Gerard & J-L . Dekeyzer. In IEEE proceedings SIES'2007, pages 118-125, Lisboa, July 2007.*

[MLD+07] *Julio Medina, Patricia Lopez, Jose Maria Drake, Francois Terrier, Sebastien Gerard.* A Modeling Approach for the Timing Verification of COTS Components-based Distributed Hard Real-Time Systems*. In Proccedings of the Workshop on Models and Analysis for Automotive Systems, held in conjunction with the 2006 RTSS, 2006.*

[MAP+07] *Marau R; L. Almeida; P. Pedreiras; M. González Harbour; Sangorrín D.; Medina J., Integration of a flexible network in a resource contracting framework, 13th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS - 2007) ; 03/04/2007 - 06/04/2007 ; Seattle ; US.*

[MLD07] *Medina J.; Lopez P.; Drake J.M., Towards a UML Profile for Real-Time Modelling of Component-Based Distributed Embedded Systems. Forum on Specification and Design Languages (FDL - 2006) ; 19/09/2006 - 22/09/2006 ; Darmstadt ; Germany*

[LMD07] *Lopez P.; Medina J.; Drake J.M., Real-Time Modelling of Distributed Component-based Applications. 32nd EUROMICRO Conference on Software Engineering and Advanced Applications (EUROMICRO-SEAA - 2006) ; 29/08/2006 - 01/09/2006 ; Cavtat/Dubrovnik ; Croatia*

[DKL07] H. Dierks, S. Kupferschmid, K.G.Larsen; Automatic Abstraction Refinement for Timed Automata; FORMATS 2007; LNCS; Springer

[ED*07] F. Eisenbrand, W. Damm, A. Metzner, G. Shmonin, R. Wilhelm, and S. Winkel. Mapping Task-Graphs on Distributed ECU Networks: Efficient Algorithms for Feasibility and Optimality. In Proceedings of the 12th IEEE Conference on Embedded and Real-Time Computing Systems and Applications. IEEE Computer Society, 2006.

[BCC+] A. Benveniste, B. Caillaud, L.P. Carloni, P. Caspi, A.L. Sangiovanni-Vincentelli and S. Tripakis, Communication by Sampling in Time-Sensitive Distributed Systems , in Proceedings of the Sixth International Conference on Embedded Software (EMSOFT), Seoul, Korea, October, 2006.

11.2 Adaptive Real-Time

1. Giorgio Buttazzo and Anton Cervin, "Comparative Assessment and Evaluation of Jitter Control Methods", Proc. of the 15th International Conference on Real-Time and Network Systems, Nancy, France, March 29-30, 2007.
2. Hoai Hoang and Giorgio Buttazzo, "Reducing Delay and Jitter in Software Control Systems", Proc. of the 15th International Conference on Real-Time and Network Systems, Nancy, France, March 29-30, 2007.
3. Mauro Marinoni and Giorgio Buttazzo, "Elastic DVS Management in Processors with Discrete Voltage/Frequency Modes", IEEE Transactions on Industrial Informatics, Vol. 3, No. 1, pp. 51-62, February 2007.
4. Giorgio Buttazzo, Pau Marti, and Manel Velasco, "Quality-of-Control Management in Overloaded Real-Time Systems", IEEE Transactions on Computers, Vol. 56, No. 2, pp. 253-266, February 2007.
5. Mauro Marinoni, Tullio Facchinetti, Giorgio Buttazzo, and Gianluca Franchino, "An Embedded Real-Time System for Autonomous Flight Control", 50th Int. Congress of ANIPLA on Methodologies for Emerging Technologies in Automation (ANIPLA 2006), Rome, Nov. 2006.
6. G. Buttazzo, G. Chiandussi, C. Demartini, G. Iannizzotto, L. Lo Bello and F. Quagliotti, "Land control and monitoring system for fire prevention", 50th Int. Congress of ANIPLA on Methodologies for Emerging Technologies in Automation (ANIPLA 2006), Rome, Nov. 2006.
7. Mauro Marinoni and Giorgio Buttazzo, "Balancing Energy vs. Performance in Processors with Discrete Voltage/Frequency Modes", Proceedings of the 12th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, Sydney, Australia, August 2006.
8. Hoai Hoang, Giorgio Buttazzo, Magnus Jonsson, and Stefan Karlsson, "Computing the Minimum EDF Feasible Deadline in Periodic Systems", Proceedings of the 12th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, Sydney, Australia, August 2006.
9. I. Estévez Ayres, L. Almeida, M. García Valls, and P. Basanta Val. An Architecture to Support Dynamic Service Composition in Distributed Real-Time Systems. Accepted for publication in 10th IEEE International Symposium on Object/Component/Service-Oriented Real-Time Distributed Computing (ISORC 2007). Santorini Island, Greece. May 2007.
10. P. Basanta Val, L. Almeida, M. García Valls, and I. Estévez Ayres. Towards a synchronous scheduling service on top of an unicast distributed real-time Java. Accepted for publication in 13th IEEE Real-time Systems Application Symposium (RTAS' 2007).
11. S. Baruah and A. Burns, “Sustainable Scheduling Analysis”, In Proceedings of the 27th IEEE Real-Time Systems Symposium, pp. 159-168, December 2006.

12. Mario Aldea Rivas and Michael González Harbour. Operating System Support for Execution Time Budgets for Tread Groups. 13th International Real-Time Ada Workshop (IRTAW), Woodstock, VT, USA, April 2007.
13. R. Marau, L. Almeida, P. Pedreiras, M. González Harbour, D. Sangorrín, and J. Medina. Integration of a Flexible Network in a Resource Contracting Framework. IEEE Real-Time and Embedded Technology and Applications Symposium, WiP session, Bellevue, WA, USA, April 2007.
14. Julio L. Medina, Patricia López, José M. Drake, François Terrier and Sèbastien Gerard. A Modeling Approach for the Timing Verification of COTS Components-based Distributed Hard Real-Time Systems. Workshop on Models and Analysis for Automotive Systems (RTSS2006-WMAAS), held in conjuntion with the RTSS-2006, Rio de Janeiro, Brasil, December 2006.
15. I. Estevez-Ayres, L. Almeida, M. Garcia-Valls, P. Basanta-Val. An Architecture to Support Dynamic Service Composition in Distributed Real-Time Systems. 10th IEEE Symp. on Object/component/service-oriented Real-time distributed Computing, ISORC 2007. Santorini, Greece. 7-9 May 2007.
16. P. Basanta-Val, L. Almeida, M. Garcia-Valls, I. Estevez-Ayres. Towards a synchronous scheduling service on top of a unicast distributed real-time Java. 13th IEEE Real-Time and Embedded Applications Symposium, RTAS 2007. Bellevue, USA. 3-6 April 2007.
17. R. Marau, L. Almeida, P. Pedreiras, M. González-Harbour, D. Sangorrín, J. L. Medina. Integration of a flexible network in a resource contracting framework. 13th IEEE Real-Time and Embedded Applications Symposium, RTAS 2007 - Proc. of the Work-in-Progress Session. Bellevue, USA. 3-6 April 2007.
18. G. BUTTAZZO, G. CHIANDUSSI, C. DEMARTINI, G. IANNIZZOTTO, LO BELLO L., F. QUAGLIOTTI. (2006). Land control and monitoring system for fire prevention. In: Methodologies for Emerging Technologies in Automation. 50th International Congress on Methodologies for Emerging Technologies in Automation, ANIPLA 06. 13-15 November 2006. (vol. I). Special Session on Land Monitoring and Control.

CEA-LIST, UPM and THALES have collaborated in the Task Force that produced the new version of the UML profile for QoS and Ft.

UPM and UC3M have collaborated on the definition of the API included in the ISO/IEC 23004 part 4.

A number of publications acknowledge the help and support of other members of ARTIST2. Workshop papers for IRTAW and JTRES for example usually have single site authorship, but they set the context for joint discussions and future work.

The session reports of the 13th IRTAW were the result of joint work at and during the workshop. The six reports will appear both in the Proceedings of the 13th IRTAW, Volume XXVII Issue 2, ACM AdaLetters, August 2007 (still to appear), and in future issues of the Ada User Journal.

Porto and CMU

[PO14] N. Pereira, B. Andersson, E. Tovar, A. Rowe, “Static-Priority Scheduling over Wireless Networks with Multiple Broadcast Domains”, to Appear in Proceedings of RTSS07, Tucson, USA.

Porto and Prague

[PO16] Jurcik, P., Koubâa, A., Alves, M., Tovar, E., Hanzalek, Z., "A Simulation Model for the IEEE 802.15.4 protocol: Delay/Throughput Evaluation of the GTS Mechanism", to be published in the 15th IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS´07), Istanbul, Turkey, October 2007

Porto and Vienna

[PO18] B. Andersson, N. Pereira, W. Elmenreich, E. Tovar, F. Pacheco, N. Cruz, "A Scalable and Efficient Approach to Obtain Measurements in CAN-based Control Systems", Submitted to a Journal.

Aveiro and Madrid

[MAD01] I. Calvo, L. Almeida, A. Noguero, "A Novel Synchronous Scheduling Service for CORBA-RT Applications", published at the 10th IEEE Symp. on Object/component/service-oriented Real-time distributed Computing, ISORC 2007. Santorini, Greece, May 2007

[MAD02] P. Basanta-Val, L. Almeida, M. Garcia-Valls, I. Estevez-Ayres, "Towards a synchronous scheduling service on top of a unicast distributed real-time Java", published at the 13th IEEE Real-Time and Embedded Applications Symposium (RTAS 2007), Bellevue, USA, Apr. 2007

Pisa and Aveiro

[PIS01] Bartolini, C., Almeida, L., Lipari, G., "Using priority inheritance techniques to override the size limit of CAN messages", to be published at the 7th IFAC Conf on Fieldbuses and Networks for Industrial and Embedded Systems (FET 2007), Toulouse, France, Nov 2007

Mallorca and Aveiro

[MAL01] J. Proenza, L. Almeida. Position Paper on Dependability and Reconfigurability in Distributed Embedded Systems. RTN'07, 6th Workshop on Real-Time Networks, (satellite of ECRTS'07), Pisa, Italy, Jul. 2007.

Pisa and Catania

[PIS02] Buttazzo, G., Chiandussi, G., Demartini, C., Inannizzoto, G., Lo Bello L., Quagliotti, F., "Land control and monitoring system for fire prevention. In: Methodologies for Emerging Technologies in Automation", published in proceedings of the 50th International Congress on Methodologies for Emerging Technologies in Automation (ANIPLA 06), Special Session on Land Monitoring and Control, Nov. 2006.

Catania and Malardalen

[CT9] Lo Bello, L., Kaczynski, G., Nolte, T., Sorbello, G., Sgro', F., Mirabella, O., "An approach to support UAV to ground station real-time communications in a land monitoring system", published in proceedings of the 50th International Congress on Methodologies for Emerging Technologies in Automation (ANIPLA 06), Special Session on Land Control and Monitoring System for Fire Prevention, Nov. 2006

[CT10] Lo Bello L., Kaczynski, G., Nolte, T., "Towards a Robust Real-Time Wireless Link in a Land Monitoring Application", published in proceedings of the 11th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA 06), vol. I, pp. 449-452, ISBN/ISSN: 1-4244-0681-1, Sep. 2006

C. Otero-Perez, J v. EIndhoven, G. Fohler: "Execution-aware cache reservations for media applications", submitted

R. Marau, L. Almeida, P. Pedreiras, M. González Harbour, D. Sangorrín, and J. Medina. Integration of a Flexible Network in a Resource Contracting Framework. IEEE Real-Time and Embedded Technology and Applications Symposium, WiP session, Bellevue, WA, USA, April 2007.

R. Marau, L. Almeida, P. Pedreiras, M. González Harbour, D. Sangorrín. “Integration of a flexible time triggered network in the FRESCOR resource contracting framework”.Emerging Technologies and Factory Automation, ETFA 2007, submitted.

S.Perathoner, E.Wandeler, L.Thiele, A.Hamann, S.Schliecker, R.Henia, R.Eacu, R.Ernst, M. González Harbour, “Influence of different system abstractions on the performance analysis of distributed realtime systems”. ACM Conference on Embedded Systems Software, EMSOFT 2007, accepted.

J. Silvestre, L. Almeida, R. Marau, P. Pedreiras. Dynamic QoS Management for Multimedia Real-Time Transmission in Industrial Environments. ETFA 2007, 12th IEEE International Conference on Emerging Technologies and Factory Automation. Patras, Greece, September 2007.

I. Estevez-Ayres, L. Almeida, M. Garcia-Valls, P. Basanta-Val. An Architecture to Support Dynamic Service Composition in Distributed Real-Time Systems. 10th IEEE Symp. on Object/component/service-oriented Real-time distributed Computing, ISORC 2007. Santorini, Greece. 7-9 May 2007.

J. Silvestre, R. Marau, L. Almeida, P. Pedreiras. MJPEG Real-Time Transmission in Industrial Environments Using a CBR Channel. Proc. of 16th Int. Conf. on Computer and Information Society Engineering, CISE 2006, Venice, Italy, 24-26 November, 2006 (also Enformatika Trans. on Engineering, Computing And Technology, Volume 16, November 2006. ISSN 1305-5313).

M. Santos, L. Almeida, J. Fuertes. Dual-Rate Switching Control. CONTROLO 2006, Lisboa, Portugal, September 2006.

R.I. Davis, A. Burns, R.J. Bril, and J.J. Lukkien. “Controller Area Network (CAN) Schedulability Analysis: Refuted, Revisited and Revised”. Real-Time Systems, Volume 35, Number 3, pp. 239-272, April 2007.

Giorgio Buttazzo and Anton Cervin, "Comparative Assessment and Evaluation of Jitter Control Methods", Proc. of the 15th International Conference on Real-Time and Network Systems, Nancy, France, March 29-30, 2007.

Hoai Hoang and Giorgio Buttazzo, "Reducing Delay and Jitter in Software Control Systems", Proc. of the 15th International Conference on Real-Time and Network Systems, Nancy, France, March 29-30, 2007.

Mauro Marinoni and Giorgio Buttazzo, "Elastic DVS Management in Processors with Discrete Voltage/Frequency Modes", IEEE Transactions on Industrial Informatics, Vol. 3, No. 1, pp. 51-62, February 2007.

Giorgio Buttazzo, Pau Marti, and Manel Velasco, "Quality-of-Control Management in Overloaded Real-Time Systems", IEEE Transactions on Computers, Vol. 56, No. 2, pp. 253-266, February 2007.

Mauro Marinoni, Tullio Facchinetti, Giorgio Buttazzo, and Gianluca Franchino, "An Embedded Real-Time System for Autonomous Flight Control", 50th Int. Congress of ANIPLA on Methodologies for Emerging Technologies in Automation (ANIPLA 2006), Rome, Nov. 2006.

G. Buttazzo, G. Chiandussi, C. Demartini, G. Iannizzotto, L. Lo Bello and F. Quagliotti, "Land control and monitoring system for fire prevention", 50th Int. Congress of ANIPLA on Methodologies for Emerging Technologies in Automation (ANIPLA 2006), Rome, Nov. 2006.

Mauro Marinoni and Giorgio Buttazzo, "Balancing Energy vs. Performance in Processors with Discrete Voltage/Frequency Modes", Proceedings of the 12th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, Sydney, Australia, August 2006.

Hoai Hoang, Giorgio Buttazzo, Magnus Jonsson, and Stefan Karlsson, "Computing the Minimum EDF Feasible Deadline in Periodic Systems", Proceedings of the 12th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, Sydney, Australia, August 2006.

11.3 Compilers and Timing Analysis

- Reinhard Wilhelm, Jakob Engblom, Andreas Ermedahl, Niklas Holsti, Stephan Thesing, David Whalley, Guillem Bernat, Christian Ferdinand, Reinhold Heckmann, Frank Mueller, Isabelle Puaut, Peter Puschner, Jan Staschulat, , and Per Stenström. The Determination of Worst-Case Execution Times-Overview of the Methods and Survey of Tools. Accepted for ACM Transactions on Embedded Computing Systems (TECS), 2007.
- Christian Ferdinand (AbsInt), Reinhold Heckmann (AbsInt), Hans-Joerg Wolff, Christian Renz, Oleg Parshin (USaar), and Reinhard Wilhelm (USaar). Towards Model-Driven Development of Hard Real-Time Systems - Integrating ASCET-MD and aiT/StackAnalyzer. In *Proceedings of Automotive Software Workshop in San Diego*, 2006
- Christian Ferdinand (AbsInt), Reinhold Heckmann (AbsInt), Hans-Joerg Wolff, Christian Renz, Manabendra Gupta, Oleg Parshin (USaar): Towards an Integration of Low-Level Timing Analysis and Model-Based Code Generation. In: Tiziana Margaria, Anna Philippou, Bernhard Steffen (Eds.) IEEE-ISoLA 2006 - 2nd International Symposium on Leveraging Applications of Formal Methods, Verification and Validation, 15-19 November 2006, Paphos, Cyprus, pages 235-241.
- C. Ferdinand (AbsInt), F. Martin (AbsInt), C. Cullmann (AbsInt), M. Schlickling (USaar), I. Stein (AbsInt), S. Thesing (USaar), R. Heckmann (AbsInt): New Developments in WCET Analysis. In: Thomas Reps, Mooly Sagiv, Jörg Bauer (Eds.), Program Analysis and Compilation, Theory and Practice. Lecture Notes in Computer Science 4444, pages 12-52, Springer-Verlag, 2007.
- Daniel Sehlberg, Andreas Ermedahl, Jan Gustafsson, Björn Lisper, Steffen Wiegratz (AbsInt Angewandte Informatik GmbH, Saarbrucken, Germany): Static WCET Analysis of Real-Time Task-Oriented Code in Vehicle Control Systems. 2nd International Symposium on Leveraging Applications of Formal Methods (ISOLA'06), Paphos, Cyprus.
- The Worst-Case Execution Time Problem - Overview of Methods and Survey of Tools, Reinhard Wilhelm, Jakob Engblom (Virtutech, Sweden), Andreas Ermedahl, Niklas Holsti (Tidorum LTD), Stephan Thesing, David Whalley, Guillem Bernat, Christian Ferdinand, Reinhold Heckmann, Tulika Mitra, Frank Muller, Isabelle Puaut, Peter Puschner, Jan Staschulat, Per Stenström, MRTC report ISSN 1404-3041 ISRN MDH-MRTC-209/2007-1-SE, Mälardalen Real-Time Research Centre, Mälardalen University, March, 2007

- Heiko Falk, Sascha Plazar and Henrik Theiling. Compile-Time Decided Instruction Cache Locking Using Worst-Case Execution Paths. In Proceedings of "The International Conference on Hardware/Software Codesign and System Synthesis" (CODES+ISSS), Salzburg, Austria, October 2007.
- Paul Lokuciejewski, Heiko Falk, Martin Schwarzer, Peter Marwedel and Henrik Theiling. Influence of Procedure Cloning on WCET Prediction. In Proceedings of "The International Conference on Hardware/Software Codesign and System Synthesis" (CODES+ISSS), Salzburg, Austria, October 2007.

Aachen/ACE

- M. Hohenauer, C. Schumacher, R. Leupers, G. Ascheid, H. Meyr, H. van Someren: Retargetable Code Optimization with SIMD Instructions, IEEE/ACM Int. Conf. on Hardware/Software Codesign and System Synthesis (CODES+ISSS), Seoul (Korea), Oct 2006

Dortmund University/Absint

- Heiko Falk, Sascha Plazar and Henrik Theiling. Compile-Time Decided Instruction Cache Locking Using Worst-Case Execution Paths. In Proceedings of "The International Conference on Hardware/Software Codesign and System Synthesis" (CODES+ISSS), Salzburg, Austria, October 2007.
- Paul Lokuciejewski, Heiko Falk, Martin Schwarzer, Peter Marwedel and Henrik Theiling. Influence of Procedure Cloning on WCET Prediction. In Proceedings of "The International Conference on Hardware/Software Codesign and System Synthesis" (CODES+ISSS), Salzburg, Austria, October 2007.

11.4 Execution Platforms

[KHET07] Simon Künzli, Arne Hamann, Rolf Ernst, Lothar Thiele: Combined Approach to System Level Performance Analysis of Embedded Systems CODES/ISSS 2007, Salzburg, Austria, 2007.

[SSE07] Simon Schliecker and Steffen Stein and Rolf Ernst. Performance Analysis of Complex Systems by Integration of Dataflow Graphs and Compositional Performance Analysis. In *Proc. of Design, Automation and Test in Europe (DATE)*, January 2007.

[SIE06] Simon Schliecker and Matthias Ivers and Rolf Ernst. Integrated Analysis of Communicating Tasks in MPSoCs. In *Proc. 3rd International Conference on Hardware Software Codesign and System Synthesis (CODES)*, Seoul, Korea, January 2006.

[DAM06] P. Del Valle, D. Atienza, I. Magan, J. Flores, E. Perez, J. Mendias, L. Benini, and G. De Micheli, ``A Complete Multi-Processor System-on-Chip FPGA-Based Emulation Framework," in *IFIP/IEEE International Conference on Very Large Scale Integration (VLSI-SoC)*, pp. 140-145, 2006.

[CAD06] S. Carta, A. Acquaviva, P. G. Del Valle, M. Pittau, D. Atienza, F. Rincon, G. De Micheli, L. Benini, and J. M. Mendias, ``Multi-Processor Operating System Emulation Framework with Thermal Feedback for Systems-on-Chip," in 17th ACM Great Lakes Symposium on VLSI (GLSVLSI), pp. 311-316, 2007.

[TVLSI] P. Pop, V. Izosimov, P. Eles, Z. Peng, "Design Optimization of Time- and Cost-Constrained Fault-Tolerant Embedded Systems with Checkpointing and Replication", submitted to IEEE Transactions on VLSI Systems, 2007.

[FrH07] M. Fränzle, M. R. Hansen, *Deciding an Interval Logic with Accumulated Durations*, TACAS 2007, LNCS 4424, pp. 201-215, Springer-Verlag, 2007

[MVM06] Kehuai Wu, Andreas Kanstein, Jan Madsen and Mladen Berekovic *MT-ADRES: Multithreading on Coarse-Grained Reconfigurable Architecture* International Workshop on Applied Reconfigurable Computing 2007.

[Fal07] Heiko Falk, Sascha Plazar and Henrik Theiling. Compile-Time Decided Instruction Cache Locking Using Worst-Case Execution Paths. *In: Proceedings of "The International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS)*, Salzburg, Austria, October 2007.

[Lok07] Paul Lokuciejewski, Heiko Falk, Martin Schwarzer, Peter Marwedel and Henrik Theiling. Influence of Procedure Cloning on WCET Prediction. *In: Proceedings of The International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS)*, Salzburg, Austria, October 2007.

[Pop07] P. Pop, K. H. Poulsen, V. Izosimov, and P. Eles: Scheduling and Voltage Scaling for Energy / Reliability Trade-offs in Fault-Tolerant Time-Triggered Embedded Systems, *ACM/IEEE International Conference on Hardware-Software Codesign and System Synthesis*, 2007

[Pop2-07] P. Pop, V. Izosimov, P. Eles, and Z. Peng: Design Optimization of Time- and Cost-Constrained Fault-Tolerant Embedded Systems with Checkpointing and Replication, *submitted to IEEE Transactions on VLSI Systems*, 2007

[Ver06] Manish Verma, Lars Wehmeyer, Robert Pyka, Peter Marwedel, Luca Benini: Compilation and Simulation Tool Chain for Memory Aware Energy Optimizations, *6th SAMOS International Workshop*, 2006, p. 279-288.

[Wil07] Reinhard Wilhelm, Jakob Engblom, Andreas Ermedahl, Niklas Holsti, Stephan Thesing, David Whalley, Guillem Bernat, Christian Ferdinand, Reinhold Heckmann, Frank Mueller, Isabelle Puaut, Peter Puschner, Jan Staschulat, and Per Stenström: The Determination of Worst-Case Execution Times-Overview of the Methods and Survey of Tools, *accepted for ACM Transactions on Embedded Computing Systems (TECS)*, 2007.

[PWT+07] S. Perathoner, E. Wandeler, L. Thiele, A. Hamann, S. Schliecker, R. Henia, R. Racu, R. Ernst, M. González Harbour. Influence of Different System Abstractions on the Performance Analysis of Distributed Real-Time Systems. In Proc. of the ACM Conference on Embedded Systems Software (EMSOFT), Salzburg, Austria, October, 2007.

[KHE+07] Simon Künzli, Arne Hamann, Rolf Ernst, Lothar Thiele. Combined Approach to System Level Performance Analysis of Embedded Systems. In Proc. of the IEEE Conference on Hardware/Software Codesign and System Sythesis (CODES/ISSS), Salzburg, Austria, 2007.

[PPE+07] Traian Pop, Paul Pop, Petru Eles, Zebo Peng. Analysis and Optimisation of Hierarchically Scheduled Multiprocessor Embedded Systems, Intl. Journal of Parallel Programming, 2007 (to be published).

[PPI+07] Kare Poulsen, Paul Pop, Viacheslav Izosimov, Petru Eles. Scheduling and Voltage Scaling for Energy/Reliability Trade-offs in Fault-Tolerant Time-Triggered Embedded Systems, Intl. Conf. on Hardware/Software Codesign and System Synthesis (CODES+ISSS), Salzburg, 2007.

[PPE+07b] Traian Pop, Paul Pop, Petru Eles, Zebo Peng. Bus Access Optimisation for FlexRay-based Distributed Embedded Systems, Design, Automation, and Test in Europe Conference (DATE'07), Nice, France, April 2007.

[MAS07a] S. Mahadevan, F. Angiolini, J. Sparsø, L. Benini, J. Madsen. A Reactive IP Emulator for Multi-Processor System-on-Chip Exploration, *IEEE Transaction on CAD*, 2007. (Accepted for publication).

[MAS07b] S. Mahadevan, F. Angiolini, J. Sparsø, L. Benini, J. Madsen. A cycle-true traffic generator capturing context switching effects. In R. Reis, A. Osseiran, H-J. Pfleiderer, editors, *VLSI-SoC: From Systems to Silicon*, IFIP series, vol. 240. Springer, 2007. (Accepted for publication).

[MAS07c] S. Mahadevan, F. Angiolini, J. Sparsø, M. Storgaard, J. Madsen, A Network Traffic Generator Model for Fast Network-on-Chip Simulation. In R. Lauwereins, J. Madsen, editors, *Design, Automation, and Test in Europe: The Most Influential Papers of 10 Years DATE*. Springer, 2007

Ruggiero M., Pari G., A. Guerri, D. Bertozzi, M. Milano, L. Benini, Andrei A., "A Cooperative, Accurate Solving Framework for Optimal Allocation, Scheduling and Frequency Selection on Energy-Efficient MPSoCS", Proceedings of The IEEE International SOC Conference (SOCC), 2006.

C. Moser, L. Thiele, D. Brunelli, and L. Benini, "Adaptive Power Management in Energy Harvesting Systems.", In *Design, Automation and Test in Europe (DATE 07)*, Nice, France, April 16-20, 2007.

P. Pop, K. H. Poulsen, V. Izosimov, P. Eles, "Scheduling and Voltage Scaling for EnergyReliability Trade-offs in Fault-Tolerant Time-Triggered Embedded Systems", ACM/IEEE International Conference on Hardware-Software Codesign and System Synthesis, 2007.

K. H. Poulsen, P. Pop, V. Izosimov, "Energy-Aware Synthesis of Fault-Tolerant Schedules for Real-Time Distributed Embedded Systems", Euromicro Conference on Real-Time Systems (ECRTS, WiP session), 2007

11.5 Control for Embedded Systems

Naser et al (2007). Tahir Naseer Qureshi, DeJiu Chen, Magnus Persson and Martin Törngren. Simulation Tools for Dynamically Reconfigurable Automotive Embedded Systems - An evaluation of TrueTime. Real-Time in Sweden 2007 (RTiS2007), August 21-22, Västerås, Sweden.

Sjöstedt et al (2007). Carl-Johan Sjöstedt, DeJiu Chen, De-Jiu Chen, Phillipe Cuenot, Patrick Frey, Rolf Johansson, Henrik Lönn, David Servat, Martin Törngren. Developing Dependable Automotive Embedded Systems using the EAST-ADL; representing continuous time systems in SysML. In Proc. of EOOLT'2007. 1st Int. Workshop on Equation-Based Object-Oriented Languages and Tools.

Shi et al (2007). Jianlin Shi, Martin Törngren, David Servat, Carl-Johan Sjöstedt, DeJiu Chen, Henrik Lönn. Combined usage of UML and Simulink in the Design of Embedded Systems: Investigating Scenarios and Structural and Behavioral Mapping. To appear in Proc. of OMER 4 workshop on Object-oriented modeling of embedded real-time systems, Oct. 30-31, 2007.

Cuenot et al (2007a). Philippe Cuenot, DeJiu Chen, Sébastien Gérard, Henrik Lönn, Mark-Oliver Reiser, David Servat, Ramin Tavakoli Kolagari, Carl-Johan Sjöstedt, Martin Törngren, Matthias Weber. Managing Complexity of Automotive Electronics Using the EAST-ADL. Accepted for the 2nd Int. UML&AADL Workshop (UML&AADL'2007) at the 12th Int. Conf. On Engineering of Complex Computer Systems, Auckland, New Zealand, July 11 - 14, 2007.

Larses et al (2007). Ola Larses, Carl-Johan Sjöstedt, Martin Törngren, Ola Redell. Experiences from Model supported Configuration Management and Production of Automotive Embedded Software. In Proceedings of the SAE World Congress, In-Vehicle Software session, Detroit, USA, 2007.

Cuenot et al (2007a). Philippe Cuenot, DeJiu Chen, Sébastien Gérard, Henrik Lönn, Mark-Oliver Reiser, David Servat, Ramin Tavakoli Kolagari, Carl-Johan Sjöstedt, Martin Törngren, Matthias Weber. Managing Complexity of Automotive Electronics Using the EAST-ADL. In Proc. of the 2nd Int. UML&AADL Workshop (UML&AADL'2007) at the 12th Int. Conf. On Engineering of Complex Computer Systems, Auckland, New Zealand, July 11 - 14, 2007.

Axelsson et al (2007). Martin Axelsson, Magnus Eriksson, Thomas Francke, Felix Hammarstrand, Andreas Lindell, Oskar Nyqvist, Erik Persson, Martin Svensson, Christoffer Strömberg, Niklas Thörnqvist, Magnus Persson, Martin Törngren. The Saint3 automotive embedded systems demonstrator. Technical report, Department of Machine Design, KTH, 2007 (in print).

Cervin et al (2006). Anton Cervin, Karl-Erik Årzén, Dan Henriksson, Manuel Lluesma Camps, Patricia Balbastre, Ismael Ripoll, Alfons Crespo: Control Loop Timing Analysis Using TrueTime and Jitterbug, In Proceedings of the 2006 IEEE Computer Aided Control Systems Design Symposium, October 2006.

Årzén et al (2007a). Karl-Erik Årzén, Antonio Bicchi, Gianluca Dini, Stephen Hailes, Karl Henrik Johansson, John Lygeros, Anthony Tzes: “A component-based approach to the design of networked control systems” In Proceedings of the European Control Conference, July 2007

Årzén et al (2007b). Karl-Erik Årzén, Antonio Bicchi, Gianluca Dini, Stephen Hailes, Karl Henrik Johansson, John Lygeros, Anthony Tzes: “A component-based approach to the design of networked control systems”, European Journal of Control, 13:2-3, 2007 (extended version of (Årzén et al 2007a))

INVITED BOOK CHAPTERS

Cuenot et al (2007b). Philippe Cuenot, DeJiu Chen, Sébastien Gérard, Henrik Lönn, Mark-Oliver Reiser, David Servat, Ramin Tavakoli Kolagari, Martin Törngren, Matthias Weber. Improving Dependability by Using an Architecture Description Language. Accepted book chapter contribution for the forthcoming book Architecting Dependable Systems IV. Editors: Rogerio de Lemos, Cristina Gacek, Alexander Romanovsky. Springer series: Lecture Notes in Computer Science, Vol .4615, 2007. ISBD 978-3-540-74033-9.

Törngren et al. (2007). Törngren Martin, DeJiu Chen, Diana Malvius, Jakob Axelsson. Model based development of automotive embedded systems. Invited chapter in the forthcoming Automotive Embedded Systems Handbook. Editors Nicolas Navet and Francoise Simonot-Lion. Taylor and Francis CRC Press - Series: Industrial Information Technology. ISBN: 9780849380266. Publication Date: 1/30/2008.

Web links to the corresponding books:

http://www.crcpress.com/shopping_cart/products/product_detail.asp?id=&parent_id=&sku=8026&isbn=9780849380266&pc=

http://www.springer.com/west/home/computer?SGWID=4-146-22-173752106-0

[8] Giorgio Buttazzo, Anton Cervin. Comparative Assessment and Evaluation of Jitter Control Methods. In Proc. 15th International Conference on Real-Time and Network Systems, Nancy, France, March 2007.

[9] Petr Jurcik, Anis Koubaa, Mário Alves, Eduardo Tovar, Z. Hanzalek: A Simulation Model for the IEEE 802.15.4 protocol: Delay/Throughput Evaluation of the GTS Mechanism, to be published in the 15th IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS´07), Istanbul, Turkey, October 2007.

[10] Ricardo Marau, Pedro Leite, Luis Almeida, Manel Velasco, Pau Mart´i, Josep M. Fuertes. Performing Flexible Control on Low Cost Microcontrollers using a Minimal Real-Time Kernel. Submitted to IEEE Transactions on Industrial Informatics.

[11] M. Santos, L. Almeida, J. Fuertes. Design Space of a Dual-Rate Switching Controller. CONTROLO 2006, Lisboa, Portugal, September 2006.

[12] M. Santos, L. Almeida, J. Fuertes. Dual-Rate Switching Control. Submitted to Control Engineering Practice.

[14] Karl-Erik Årzén, Antonio Bicchi, Gianluca Dini, Stephen Hailes, Karl Henrik Johansson, John Lygeros, Anthony Tzes. A component-based approach to the design of networked control systems, In Proceedings of the European Control Conference, July 2007.

[15] Karl-Erik Årzén, Antonio Bicchi, Gianluca Dini, Stephen Hailes, Karl Henrik Johansson, John Lygeros, Anthony Tzes. A component-based approach to the design of networked control systems. European Journal of Control, 13:2-3, June 2007. (Extended journal version of [3])

[16] Anthony et al (2007a). Richard Anthony, Achim Rettberg, Isabell Jahnich, DJ Chen, Cecilia Ekelin: Towards a Dynamically Reconfigurable Automotive Control System Architecture, at “International Embedded Systems Symposium” in Irvine, CA, USA, May 29-June 1 2007

[17] Anthony et al (2007b). Richard Anthony, Achim Rettberg, Ola Redell, Tahir Naseer Quereshi, Martin Törngren, Cecilia Ekelin, Gerrit de Boer: “Dynamically Reconfigurable Automotive Control Systems” at “Advanced Automotive Electronics” in Gaydon, UK, January 31 2007.

[18] Sjöstedt et al (2007). Carl-Johan Sjöstedt, DeJiu Chen, De-Jiu Chen, Phillipe Cuenot, Patrick Frey, Rolf Johansson, Henrik Lönn, David Servat, Martin Törngren. Developing Dependable Automotive Embedded Systems using the EAST-ADL; representing continuous time systems in SysML. In Proc. of EOOLT’2007. 1st Int. Workshop on Equation-Based Object-Oriented Languages and Tools.

[19] Shi et al (2007). Jianlin Shi, Martin Törngren, David Servat, Carl-Johan Sjöstedt, DeJiu Chen, Henrik Lönn. Combined usage of UML and Simulink in the Design of Embedded Systems: Investigating Scenarios and Structural and Behavioral Mapping. To appear in Proc. of OMER 4 workshop on Object-oriented modeling of embedded real-time systems, Oct. 30-31, 2007.

[20] Cuenot et al (2007a). Philippe Cuenot, DeJiu Chen, Sébastien Gérard, Henrik Lönn, Mark-Oliver Reiser, David Servat, Ramin Tavakoli Kolagari, Carl-Johan Sjöstedt, Martin Törngren, Matthias Weber. Managing Complexity of Automotive Electronics Using the EAST-ADL. Accepted for the 2nd Int. UML&AADL Workshop (UML&AADL'2007) at the 12th Int. Conf. On Engineering of Complex Computer Systems, Auckland, New Zealand, July 11 - 14, 2007.

[53] Karl-Erik Årzén, Antonio Bicchi, Gianluca Dini, Stephen Hailes, Karl Henrik Johansson, John Lygeros, Anthony Tzes. A component-based approach to the design of networked control systems, In Proceedings of the European Control Conference, July 2007.

[54] Karl-Erik Årzén, Antonio Bicchi, Gianluca Dini, Stephen Hailes, Karl Henrik Johansson, John Lygeros, Anthony Tzes. A component-based approach to the design of networked control systems, European Journal of Control, 13:2-3, June 2007. (extended version of [])

[55] Karl-Erik Årzén, Antonio Bicchi, Stephen Hailes, Karl Henrik Johansson, John Lygeros. On the Design and Control of Wireless Networked Embedded Systems, In Proceedings of the 2006 IEEE Computer Aided Control Systems Design Symposium, October 2006.

[56] Jiri Trdlicka, Zdenek Hanzalek, Mikael Johansson: Optimal Flow Routing in Multi-hop Sensor Networks with Real-Time Constraints through Linear Programming. to be published in the 12th IEEE Conference on Emerging Technologies and Factory Automation, September 25-28, 2007 Patras.

[57] A. Cervin, K.E. Årzén, D. Henriksson, M. Lluesma , P. Balbastre, I. Ripoll, A. Crespo. Control Loop Timing Analysis Using TrueTime and Jitterbug In Proceedings of the 2006 IEEE Computer Aided Control Systems Design Symposium, October 2006.

[58] P. García, P. Alberto, T. Hägglund. Control of unstable non-minimum-phase delayed systems. Journal of Process Control Volume 16, Issue 10 , December 2006, Pages 1099-1111

11.6 Testing and Verification

Patricia Bouyer, Thomas Brihaye, Veronique Bruyere, Jean-Francois Raskin. On the Optimal Reachability Problem for Timed Automata. Formal Methods in Systems Design 31(2): 135-175 (2007).

Patricia Bouyer, Kim Guldstrand Larsen, Nicolas Markey, Jacob Illum Rasmussen: Almost Optimal Strategies in One Clock Priced Timed Games. FSTTCS 2006.

Patricia Bouyer, Kim Guldstrand Larsen, Nicolas Markey: Model-Checking One-Clock Priced Timed Automata. FoSSaCS 2007.

H. Dierks, S. Kupferschmid and K.G. Larsen; Automatic Abstraction Refinement for Timed Automata, FORMATS 2007, LNCS, Springer

M. Oostdijk, V. Rusu, J. Tretmans, R. de Vries, T. Willemse: Integrating verification, testing, and learning for cryptographic protocols, in Integrated Formal Methods (IFM'07), 2007.

Alexandre David, John Håkansson, Kim Guldstrand Larsen, Paul Pettersson: Model Checking Timed Automata with Priorities Using DBM Subtraction. FORMATS 2006.

Gerd Behrmann, Agnès Cougnard, Alexandre David, Emmanuel Fleury, Kim Guldstrand Larsen, Didier Lime: UPPAAL-Tiga: Time for Playing Games! CAV 2007.

Sebastian Kupferschmid, Klaus Dräger, Jörg Hoffmann, Bernd Finkbeiner, Henning Dierks, Andreas Podelski, Gerd Behrmann: Uppaal/DMC-Abstraction-Based Heuristics for Directed Model Checking. TACAS 2007.

Franck Cassez, Alexandre David, Didier Lime, Kim Larsen, Jean-Francois Raskin. Timed Control with Observation Based and Stuttering Invariant Strategies. To appear in ATVA'07, Lecture Notes in Computer Science, Springer Verlag, 25 pages, 2007.

Patricia Bouyer, Kim Guldstrand Larsen, Nicolas Markey: Model-Checking One-Clock Priced Timed Automata. FoSSaCS 2007.

Patricia Bouyer, Kim Guldstrand Larsen, Nicolas Markey, Jacob Illum Rasmussen: Almost Optimal Strategies in One Clock Priced Timed Games. FSTTCS 2006.

Alexandre David, John Håkansson, Kim Guldstrand Larsen, Paul Pettersson: Model Checking Timed Automata with Priorities Using DBM Subtraction. FORMATS 2006.

Henning Dierks, Sebastian Kupferschmid, Kim Larsen: Automatic Abstraction Refinement for Timed Automata. FORMATS 2007.

Partrica Bouyer, Kim G. Larsen, Nicolas Markey: Model-Checking One-Clock Priced Timed Automata. Logical Methods in Computer Science (special FoSSacS07 issue).

Sebastian Kupferschmid, Klaus Dräger, Jörg Hoffmann, Bernd Finkbeiner, Henning Dierks, Andreas Podelski, Gerd Behrmann: Uppaal/DMC-Abstraction-Based Heuristics for Directed Model Checking. TACAS 2007.

Franck Cassez, Alexandre David, Didier Lime, Kim Larsen, Jean-Francois Raskin. Timed Control with Observation Based and Stuttering Invariant Strategies. To appear in ATVA'07, Lecture Notes in Computer Science, Springer Verlag, 25 pages, 2007.

Thomas Chatain, Alexandre David, Kim G. Larsen: Playing Games with Timed Games. Under submission.

Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger, and Jean-Francois Raskin. Algorithms for omega-regular games with imperfect information. Proceedings of the 15th International Conference on Computer Science Logic (CSL), Lecture Notes in Computer Science 4207, Springer, 2006, pp. 287-302.

Thomas Brihaye, Thomas A. Henzinger, Vinayak Prabhu, and Jean-François Raskin. Minimum-time reachability in timed games. Proceedings of the 34th International Colloquium on Automata, Languages, and Programming (ICALP), Lecture Notes in Computer Science, Springer, 2007.

Krishnendu Chatterjee, Luca de Alfaro, Marco Faella, Thomas A. Henzinger, Rupak Majumdar, and Mariëlle Stoelinga. Compositional quantitative reasoning. Proceedings of the Third Annual Conference on Quantitative Evaluation of Systems (QEST), IEEE Computer Society Press, 2006, pp. 179-188.

Franck Cassez, Alexandre David, Didier Lime, Kim Larsen, and Jean-François Raskin. Timed Control with Observation Based and Stuttering Invariant Strategies.Â To appear in ATVA'07,Â Lecture Notes in Computer Science, Springer Verlag, 25 pages, 2007.

Thomas Brihaye, Thomas A. Henzinger, Vinayak S. Prabhu, and Jean-Francois Raskin. Minimum-Time Reachability in Timed Games. To appear in ICALP07, Lecture Notes in Computer Science, Springer Verlag, 2007. (12 pages)

Khrishnendu Charterjee, Laurent Doyen, Thomas A. Henzinger and Jean-François Raskin. Algorithms for Omega-regular games of Incomplete Information (extended version). Accepted for publication inÂ Logical Methods in Computer Science, 2007. (30 pages).

Patricia Bouyer, Thomas Brihaye, Véronique Bruyère, Jean-François Raskin. On the Optimal Reachability Problem for Timed Automata. Formal Methods in Systems Design 31(2): 135-175 (2007).

Laurent Doyen and Jean-François Raskin. Improved Algorithms for the Automata-based Approach to Model-Checking. In TACAS'07, Lecture Notes in Computer Science, 4424 Springer Verlag, 2007.

Patricia Bouyer, Thomas Brihaye, Fabrice Chevalier, Weighted o-minimal hybrid systems are more decidable than weighted timed automata!, proceedings of the symposium LFCS 2007, Lect. Notes in Computer Science 4514, pp 69-83, Springer.

Thomas Brihaye, François Laroussinie, Nicolas Markey, Ghassan Oreiby, Timed Concurrent Game Structures, proceedings of the conference CONCUR 2007, Lect. Notes in Computer Science 4703, pp 445-459, Springer.