Year 2 Review
Paris, November 8th and 9th, 2006

Achievements and Perspectives :

Spreading Excellence

Bruno Bouyssounouse

Verimag

Overall Vision and Strategy

Overall objective is the emergence of Embedded Systems Design as a scientific discipline. This objective is pursued within the international scientific and industrial community.

This is implemented in 3 levels:

- International Collaboration
  - High-level meetings (NSF/IST),
  - International Schools (eg: China school, SouthAmerican school)),
  - support for selected conferences (eg: Embedded Systems Week)
- European level
  - Direct organisation of top workshops and schools
  - Support for existing workshops, schools (eg: FOSAD) and conferences (eg: DATE)
  - Industrial Liaison (ARTEMIS, triggering projects and promoting standards)
- Affiliated Partners
  - Direct involvement in the workprogramme (technical meetings).

Web Portal Newsletter

International Collaboration

High-level Meetings

The purpose is to define strategic work directions and collaboration – including joint projects.

- **Helsinki meeting: Long Term Challenges in High Confidence Composable Embedded Systems**, held June 21-22, 2006 Helsinki,
  21 EU participants, 24 US participants
  Main findings:
  - Security
  - Common projects to be launched (agreement in principle to reserve a budget in the coming calls)
  - Discussion about the International Conference landscape ("Embedded Systems Week" in the Spring – that will bring together RTAS, HSCC, …)
- A followup meeting with the NSF is planned in Spring

International Collaboration

International Schools

The purpose is to disseminate European excellence and approaches to selected regions outside Europe, and drain high-quality students to Europe

- ARTIST2 / UNU-IIST Spring School April 3rd – 15th 2006 in Xi'an - more than 50 participants attended. Given the success of this first edition, it has been decided to organise a second ARTIST2 school in China, near Shanghai in 2007
- *(planned)* ARTIST2 / UNU-IIST Spring School, planned August 1-10th in Suzhou
- *(planned)* First ARTIST European-SouthAmerican School for Embedded Systems – August 27-31 2007 Buenos Aires

International Collaboration

Support for Selected Conferences

- **Embedded Systems Week 2006**, held in Seoul –
  - Federated 3 conferences: EmSoft, CODES/ISSS, CASES
  - 500 participants, strong participation from Korea and China.
  - Strong involvement from Artist2 at all levels (programme committee, co-chair, workshops, keynote speaker)
  - Given the success in Asia, it will rotate each year between Asia, Europe and the USA.

International Collaboration

Support for selected Workshops

- WESE'05 - ARTIST2 Workshop on Embedded Systems Education
  September 22nd, 2005 Embedded Systems Week - Jersey City, New Jersey – USA

- WESE'06 - ARTIST2 Workshop on Embedded Systems Education
  October 26th, 2006 Embedded Systems Week – Seoul

- ARTIST2 Workshop on Foundations and Applications of Component-based Design
  October 26th, 2006 Embedded Systems Week – Seoul

Joint Projects / Joint Proposals

(unsorted)

- IP: Reconfigurable Ubiquitous Networked Embedded Systems (**RUNES**)
  Artist2 Partners: LUND (Karl-Erik Årzén), KTH (Karl Henrik Johansson)
- Swedish SSF: Flexible Embedded Control Systems (**FLEXCON**)
  Artist2 Partners: LUND (Karl-Erik Årzén), KTH (Jan Wikander), Mälardalen (Ivica Crnkovic) Main other partners: University of Skövde (Sten F. Andler)
- Hybrid Control (**HYCON**)
  Artist2 Partners: LUND (Anders Rantzer), KTH (Karl Henrik Johansson), ETH (Manfred Morari), PARADES (Alberto Sangiovanni-Vincentelli), Univ Twente (Edgar Brinksma), INRIA (Giancarlo Ferrari Trecate)
- STREP: Advancing Traffic Efficiency and Safety through Software Technology (**ATESST**)
  Artist2 Partners: KTH (Martin Törngren), CEA (Sebastien Gerard, Francois Terrier), Volvo Technology (coordinator - affiliated partner of ARTIST2), Daimler Chrysler (affiliated partner), ETAS (affiliated partner)
- STEP: Dynamically Self-Configuring Automotive Systems (**DYSCAS**)
  Artist2 Partners: KTH (Martin Törngren), Volvo Technology (coordinator - affiliated partner of ARTIST2), Daimler Chrysler (affiliated partner of ARTIST2)
- Swedish SSF: Safety critical vehicular systems (**SAVE++)**
  Artist2 Partners: KTH (Martin Törngren), UU (Wang Yi, Paul Pettersson), MDH (Hans Hansson, Ivica Crncovic), LIU (Simin Nadjm Tehrani)
- IP: **SOCRADES** - (Service-oriented cross-layer infrastructure for distributed smart embedded devices)
  Artist2 Partners: KTH (Karl-Henrik Johansson, Mikael Johansson), ABB
- ITEA2: **EUROSYSLIB** - European Leadership in System Modelling and Simulation through advanced MODELICA Libraries,
  Artist2 Partners: LUND (Karl-Erik Årzén, Anders Rantzer), INRIA (Ramine Nikoukhah)

Joint Projects / Joint Proposals

(unsorted)

- Swedish proposal: **Reservation-Based Scheduling in Mobile Terminals**
  Artist2 Partners: Ericsson (Johan Eker), LUND (Karl-Erik Årzén, Anton Cervin)
- STREP: **FRESCOR** - Framework for Real-time Embedded Systems based on COntRacts,
  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
- Swedish: **SAVE**
  Artist2 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.
- IP: **SPEEDS**
  a concerted effort to define the new generation of end-to-end methodologies, processes and supporting tools for safety-critical embedded system design.
- Swedish KK-foundation: **Execution Time Analysis of Time-Critical Embedded Software**
  ARTIST2 participation: Malardalen, Tidorum, AbsInt
- Swedish SSF: **PROGRESS** Strategic Centre
  research centre with timing analysis of component-based embedded software as one activity
  ARTIST2 participation: Malardalen
- (KK-foundation, Swedish national funding) **Execution Time Analysis of Time-Critical Embedded** Software (proposal)
  Artist2 partners: Malardalen University (B. Lisper), AbsInt (C. Ferdinand), Tidorum (N. Holsti) Significant other Partners: Arcticus Systems AB, CC-Systems AB, IAR Systems AB, Volvo Construction Equipment AB

Selected ARTIST Publications

- **The Embedded Systems Design Challenge**
  Authors: Thomas A. Henzinger, EPFL Lausanne. Joseph Sifakis, VERIMAG Grenoble.
- **Embedded Systems Development for Embedded Applications: Trends and Challenges** *Author: Werner Damm – OFFIS presented at Embedded Systems Week 2006 in Seoul*
- **ARTIST FP5 Roadmap**
  The ARTIST FP5 project (ended March 31st 2006) has published a roadmap for research, on selected issues in embedded systems design.
- **ACM - Special Issue on Education**
  Artist2 Consortium
  This special issue of the ACM Transactions in Embedded Computing Systems aims to provide the basis for integrated undergraduate and graduate curricula covering the essential areas of knowledge for tomorrow's embedded systems engineers and researchers.
- **Embedded Systems Design - textbook**
  Textbook by Peter Marwedel, University of Dortmund
  Topics: Introductory textbook on specification, hardware, scheduling, codesign, verification
- **Languages and Tools for Hybrid Systems Design**
  Luca P. Carloni (Columbia University), Roberto Passerone (Cadence Berkeley), Alessandro Pinto (Berkeley), and Alberto L. Sangiovanni-Vincentelli (Parades/Berkeley)
  Collected data on available languages, formalism and tools that have been proposed in the past years for the design and verification of hybrid systems.
- ***Tools for Real--Time Control Systems Codesign***
  Authors: Dan Henriksson, Ola Redell, Jad El-Khoury, Martin Törngren, and Karl-Erik Årzén: Department of Automatic Control Lund Institute of Technology April 2005

In Year 2, Artist2 partners have also published at least 140 joint publications *(listed in the deliverable).*

Industrial Liaison and Standards

Objective

Disseminate state of the art research results and standards to industry, and set up collaboration activities including joint projects, point-to-point cooperation:

- **ARTEMIS**
  Our active involvement in the European Technology Platform ARTEMIS also could have a significant and long-term impact.
  - Three Artist2 members are on the steering board for the ARTEMIS European Technology Platform.
  - 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 SRA Working Groups.
- **Triggering Joint Projects**
  In addition to DECOS, ASSERT, RUNES, Artist2 partners in the recently accepted Integrated Projects:
  - SPEEDS - Speculative and Exploratory Design in Systems Engineering .
  - SOCRADES - Service-oriented cross-layer infrastructure for distributed smart embedded devices
  - SHAPES - Scalable Software Hardware Architecture Platform for Embedded Systems

Industrial Liaison and Standards

Standards

Objectives – contribute to advancing the state of the practice by brining the research perspective to evolving international standards. Our added value is to support and promote interaction and concerted actions between core and affiliated partners.

Artist2 teams work on many major standards :

- Ada Programming Language
- POSIX, IEEE 1003, ISO/IEC 9945-1 - Portable Operating Systems Interface
- Standards of the Object Management Group (OMG): OMG MARTE, MOF 2.0 QVT , UML Profile for Schedulability, Performance, and Time, MDA component: Packaging the MDA artefacts, UML Profile for Modelling Quality of Service and Fault Tolerance Characteristics and Mechanisms
- ISO/IEC TR 18037 - Programming Languages - C - Extensions to support embedded processors
- ETHERNET Powerlink, current version - 2 (EPL v2)
- AUTOSAR Timing Model
- EAST-ADL 2" UML profile for automotive architecture and component modelling
- Embedded-C
- Matlab-Simulink and Synchronous Languages

Workshops in Europe

Objective

Promote interaction and dissemination of Artist2 results and of the State of the Art to academic and industrial teams.

Workshops organized directly by Artist2 in Year 2:

- Artist2 workshop: CORDIE'06: Concurrency, Real-Time and Distribution in Eiffel–like Languages *July 4-5, 2006 York, UK*
- ARTIST2 Workshop on Requirements for Flexible Scheduling in Complex Embedded Systems *June 16th, 2006 Paris (Massy), France*
- ARTIST2 Workshop on Execution Platforms / Cluster Meeting
  May 22-23, 2006 Bologna, Italy
- ARTIST2 Workshop on Specification and Verification of Secure Embedded Systems
  May 18th, 2006 Pisa, Italy
- ARTIST2 Workshop Beyond AutoSar *March 23-24, 2006*
- ARTIST Workshop at DATE'06 *March 10th, 2006 Munich, Germany*
- Workshop: Distributed Embedded Systems *Nov 21-24, 2005 Leiden, The Netherlands*
- 31st EUROMICRO Conference - Special session: Model Driven Engineering (MDE)
  August 30th - September 3rd 2005 Porto, Portugal

Workshops in Europe

Plans for Year3: Workshops Directly Organized and Funded by Artist:

- **MARTES 2006**
  October 2nd, 2006 Genova, Italy
- **MoCC - Models of Computation and Communication**
  November 16-17, 2006 Zurich, Switzerland
- **ARTIST2 Workshop on Timing Analysis in the Industrial Development Process**
  November 17th, 2006 Paphos, Cyprus
- **ARTIST2 Workshop on Basic Concepts in Mobile Embedded Systems**
  December 3-4, 2006 Vienna – Austria

Plans for Year3: Workshops Partially Organized and Funded by Artist2:

- **JTRES 2006**
  October 11-13, 2006 Paris, France
- **ARCS 2007**
  March 12-15, 2007 Zurich, Switzerland
- **SCOPES 2007**
  April 20th, 2007 Acropolis, Nice, France

Schools in Europe

Objective

Ensure the best possible dissemination of Artist2 results and of the State of the Art to academic and industrial teams.

Schools organized directly by Artist2 in Year 2:

- **First European Laboratory on Real-Time and Control for Embedded Systems**
  July 10-14, 2006 *Pisa, Italy*
  The focus is on hands-on work, on automotive, telecommunications, robotics, and multimedia applications.
- **ARTIST2 Graduate Course on Embedded Control Systems**
  April 3-7, 2006 *Prague, Czech Repbulic*
  The objective of the Course is to provide an overview of the main principles and technologies for supporting the development of embedded control systems.
- **ARTIST2 Summer School 2005**
  September 29th - October 2nd 2005 *Nässlingen, Sweden*
  ARTIST2 Summer School on Component & Modelling, Testing & Verification, and Statical Analysis of Embedded Systems

We plan several schools in **Year3** including :

- **ARTIST2 - MOTIVES 2007** *(February 19-23, 2007* *Trento, Italy)*
  This will be a large school, modeled on last year's school in Nässlingen, and is a joint effort between the Real Time Components, Testing and Verification, Compilers and Timing Analysis, and Execution Platforms clusters.

Education – WESE'06

Objective

Increase awareness, on an international scale, of developments in Embedded Systems Design curricula.
This was the 2nd edition, and is a continuation of activities and publications started in Artist FP5..

WESE'06 was held in Seoul within the Embedded Systems week. It gathered approx 30 educators in embedded systems design. Main organisers: Jeff Jackson (U. Alabama) and Paul Caspi (Verimag).

Principal conclusions were:

- The diversity of the domain is such that both generalists and specialists are needed to assemble a coherent curriculum. Two approaches addressing this point generated considerable interest:
  - "Project-based learning" presented by KTH
  - "Active collaborative learning" presented by TU Delft
- Common definitions are lacking, to facilitate interaction, transfer/sharing of course materials.
- There is a considerable need for training and education in embedded systems design. The size of software in embedded systems is exploding.
  One (unsatisfactory) solution is "continuing education", and "training the trainers" organised quickly in Asia.
- Possible next steps:
  - curricula with an eg IEEE label,
  - guideline papers such as the Artist FP5 "Guidelines for a graduate curriculum on embedded software and systems " by P. Caspi, A. San Giovanni-Vincentelli et al. ACM Transactions on Embedded Computing Systems, 4(3), August 2005.
- Workshop will be proposed again next year, possibly over 2 days.
- Workshop presentations and conclusions are disseminated through the Artist2 web portal

Course Materials

Objective

Increase awareness, on an international scale, of developments in Embedded Systems Design curricula.

- Dissemination through the Portal
- In Year 2, Artist2 has begun disseminating recent, high-quality Course Materials via its web portal. This includes materials generated in Artist2 events, as well as pointers to high-quality materials from other sources.
- This approach to disseminating course materials will further structured, refined and increased in Year 3.

Course Materials

A few examples (to be completed and structured and completed in Year 3)

- **Models, Methods and Tools for Embedded Systems**
  The first ARTIST / UNU-IIST Spring School on Models, Methods and Tools for Embedded Systems has been held in Xi'an, China, April 3rd – 15th 2006.
- **Foundations of Security Analysis and Design**
  FOSAD 2006: 6th International School on Foundations of Security Analysis and Design
- **Real-Time and Control for Embedded Systems**
  First European Laboratory on Real-Time and Control for Embedded Systems
- **Embedded System Design: A Unified Hardware/Software Introduction**
  Textbook, slides, and labs by Frank Vahid (University of California at Riverside) and Tony Givargis (University of California at Irvine).
- **ARTIST2 Graduate Course on Embedded Control Systems**
  April 3-7, 2006 Prague, Czech Republic
  The objective of the Course is to provide an overview of the main principles and technologies for supporting the development of embedded control systems.
- **Model-Driven Design for Distributed Real-time Embedded Systems**
  (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.

Course Materials

- **First European Laboratory on Real-Time and Control for Embedded Systems**
  July 10-14, 2006 Pisa, Italy
  Real-Time distributed embedded systems play a crucial role in our society including several application domains such as automotive, telecommunications, robotics, and multimedia systems. These systems generally work under precise timing constraints, to achieve the required level of performance and predictability. Consequently, embedded systems design requires expertise in several disciplines, including control theory, networking, real-time computing, and operating systems.

- **ARTIST2 / UNU-IIST Spring School in China 2006**
  April 3-15, 2006 Xi'an, China
  The first ARTIST / UNU-IIST Spring School gathered more than 50 participants, of which approximately 40 were students from the top universities in mainland China.

- **ARTIST2 Summer School 2005**
  The ARTIST2 Summer School was held at Nässlingen, Sweden, September 29 - October 2, 2005, in conjunction with the 3rd International Conference on Formal Modelling and Analysis of Timed Systems (FORMATS'05). The Summer School offered a number of foundational tutorials accompanied by a selection of exiting new emerging technologies all given by absolute leading scientific experts of the community.

Web Portal - Objectives

Objective

Serve as a reference for Embedded Systems Design, promoting the integration and emergence of the area, including both Artist2 results, and relevant information about Embedded Systems Design in general.

The web portal disseminates information about ***contacts*** (Artist2 core and affiliated partners), and ***web links*** about:

- the Artist2 JPA events and activities,
- a fairly thorough set of links to sites of interest to the embedded systems community

We regularly receive spontaneous requests for adding information to the site.

Setting up the Artist Web Portal in its current form was a strategic decision, requiring substantial resources, both for ergonomics / graphical quality, as for the contents.

The Artist2 web portal was entered in the IST web site competition, held in October 2006.

Web Portal – Infrastructure

http://www.spip.net/en

SPIP is a publishing system developed by the minirézo to manage the site uZine. It is provided it to anyone as free software under GPL license.

Web Portal – Infrastructure Features

The web site includes several nice features to 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 and links** (hierarchy of pages) is maintained automatically.
- **Links** to a page **remain valid**, even if the structure of the site changes.
- **Homogeneous Ergonomics**: The "look and feel" of the site is always the same throughout the site. It's possible to change these ergonomics, and these changes are applied automatically throughout the site.
- Advanced **web tracking mechanisms**

Web Portal - Statistics

The Web Portal shows how visitors reach the site (over a few hours this week):

69 visits via google searches:

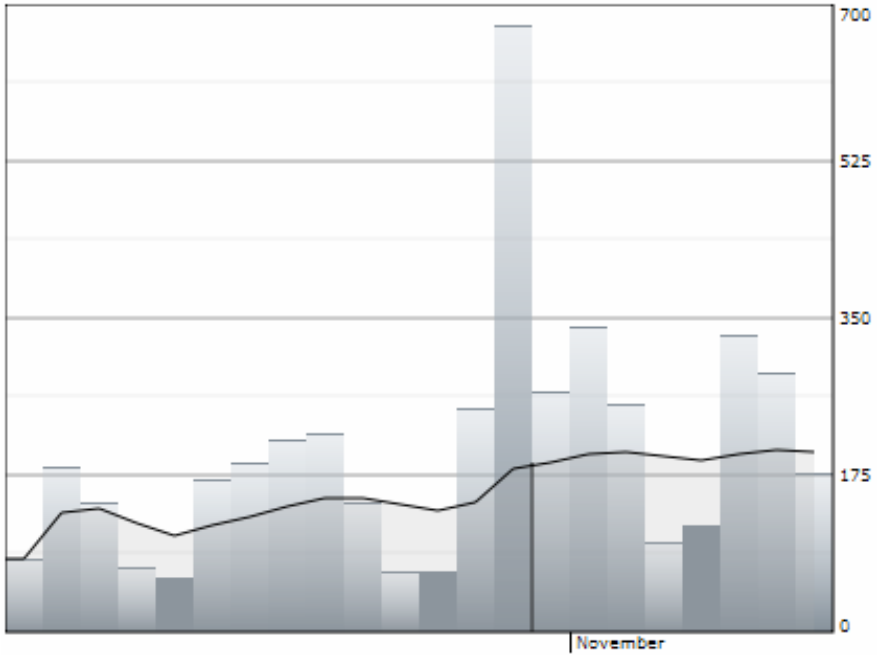
- « Design, Automation and Test i
- « SYMBOLIC TESTING TUTOR
- « APPLICATIONS OF MECHAT
- « embedded real time control sy
- « governmental conferences in s
- « Real-Time Control survey » (2
- « giorgio buttazzo »
- « managing multi video streams
- « pacific distributed system 2007
- « Journal of Embedded Computi
- « Flexray timing levels »
- « embedded control systems »
- « ECRTS 2007 »
- « "SPEEDS project" »
- « executable uml »
- « t »
- « journal on embedded system »
- « shark rtos »
- « system on chip design course
- « rio rtss real time 2006 »
- « artist2 bruno »
- « posix real-time scheduling »
- « mead education sa »
- « types of components based ap
- « stl verification and test »
- « Peter Marwedel Dortmund systems d
- « mpeg multimedia middleware »
- « shark real time »
- « design and technology time control »
- « Model Driven with Executable UML. »
- « emsoft 2007 »
- « tutorial real time uml »
- « OSEK "DO-178B" »
- « rolf ernst embedded »
- « embedded software automated Testin
- « "Computing the Minimum EDF Feasib
- « what can i control by embedded syste
- « pendulum model simulink »
- « Vlijmen »
- « main in trends on market research »
- « Journal of embedded computing »
- « faculty position opening in bioengineer
- « conferences in south korea between ja
- « ecrts 2007 »
- « common infrastructure problems »
- « System on Chip summer school; »
- « ISO/IEC TR 18037:2004 »
- « adaptive real time systems tutorials »
- « "From Specification to Embedded Sys
- « real-time uml components »
- « cluster testing »
- « path enumeration timing analysis »
- « castness »
- « real time video and robotic control techno
- « journal of embedded computing »
- « ist event »

* 5 visits: www.esweek.org
* 5 visits: dit.unitn.it (1)
  - /welcome?lang=it (2)
  - /welcome
  - /welcome

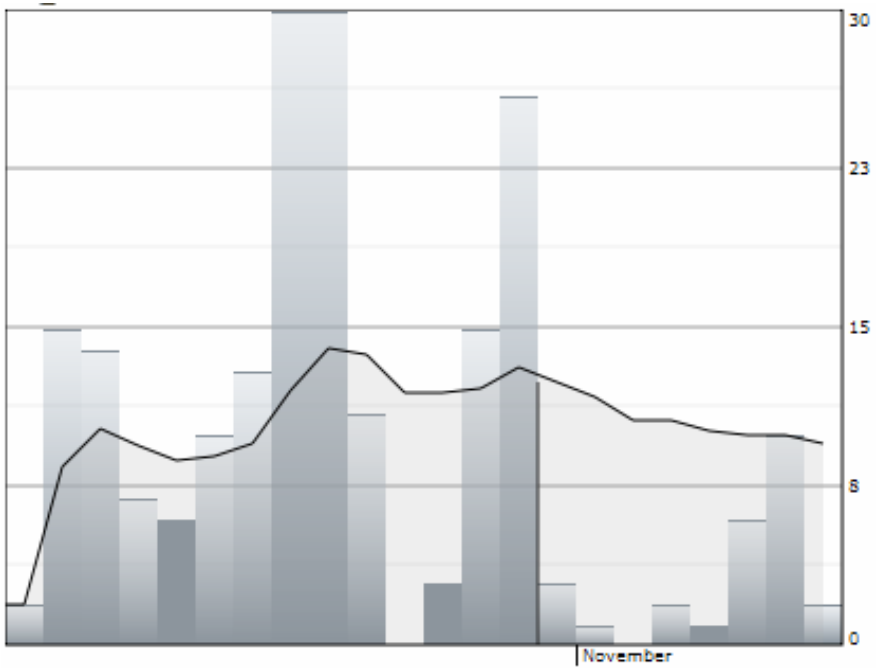
* 3 visits: europa.eu.int/information_society/isteve
* 2 visits: www.artist-embedded.com/artist/recher
* 2 visits: www.dit.unitn.it
* 2 visits: www.lsv.ens-cachan.fr/PRIVE/agenda/a
* 2 visits: ec.europa.eu/information_society/isteve
* 1 visit: www.questionanswering.com/cgi-bin/ans
* 1 visit: localhost/PRIVE/agenda/agenda.php?ca
* 1 visit: www.docs.uu.se/docs/grad-education/su
* 1 visit: www.unitn.it/agenda/uni_man_conv.phtm

Web Portal - Statistics

Visits distribution / time :



entire site



for a single page

Web Portal - Statistics

Visits distribution / sections of the web portal :

▶ Intranet2	11.7%
▶ 20. About the Artist2 NoE	3.2%
▶ 30. Participants	7.6%
▶ 40. Research and Integration	10.2%
▼ 50. Dissemination	47.7%
▶ 20. Workshops	26.8%
▶ 30. Schools	16.7%
60. Publications	2%
▶ 70. Contributions to Standards	2.2%
▼ 80. Embedded System Links	18.8%
10. Journals	3.1%
▶ 20. Conferences	8%
30. Standards	0.7%
35. Design, Development, and Validation Tools	0.5%
40. Main Projects	1.3%
50. Position Papers	1.2%
55. Roadmaps	0.4%
60. Newsletters and Magazines	0.2%
▶ 70. Announcements	2.9%
80. Publications	0.6%
▶ 90. intranet	0.8%

Artist2 Newsletter

- Announcements about leading workshops, schools, publications and other events in the area
- Distributed to aver 3500 industry and research contacts in Embedded Systems Design
- Available online:
  http://www.artist-embedded.org/FP6/ARTIST2Events/Publications/Newsletter/
- Subscription is free – send a request to: Bruno.Bouyssounouse@imag.fr


ARTIST2 Newsletter n°2

Newsletter

July 26th, 2006

INTRODUCTION

This is the second edition of the newsletter for the ARTIST2 Network of Excellence on Embedded Systems Design (http://www.artist-embedded.org/FP6/).

This newsletter is meant to serve the larger embedded systems research and industrial community, by announcing events of interest (workshops, summer schools, high level events, selected publications for a wide audience).

We hope that by providing these pointers, this newsletter will contribute to our overall objective of integration and building excellence within the community.

Editorial

Joseph Sifakis - Artist2 Scientific Coordinator

Building Up the Community

Following the recent European Technology Platform ARTEMIS conference in Graz, we have made a decisive step towards the consolidation of the ARTEMIS Strategic Research Agenda (SRA). This defines priorities in embedded systems for the IST 7th Framework Programme.

We now know that Embedded Systems have been allotted a considerably increased budget in FP7. The first calls will be published over the course of 2007. Artemis is setting up Artemisia, a non-profit organization for the implementation of the SRA. The Artemisia bylaws call for three types of members: SME, Academic, and Corporate. It is important for the academic community to participate actively in this endeavor.

The conferences landscape in embedded systems design is also integrating and gaining structure. The Embedded Systems Week organized in Seoul October 22-27, federates three major conferences: CODES/ISSS, CASES, EmSoft. The number and quality of submissions received, are signs that this will be a very successful event. Next year, the Embedded Systems Week in Salzburg will bring together these conferences, to which others will be added.

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Subscription

Subscription is free of charge. If you would like to be added or removed from the subscription list, simply send a message to the editor:

Bruno.Bouyssounouse@imag.fr


Workshops and Seminars

ARTIST2 Newsletter

July 26th, 2006

Foundations and Applications of

Component-based Design

http://www.artist-embedded.org/FP6/ARTIST2Events/Events/Components_EmSoft/

ARTIST2 Workshop - October 26th at EmSoft'06

Registration

Please register for this workshop through the regular *Embedded Systems Week* registration: http://www.it.uu.se/conf/EMSOFT06/

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.

Topics

Challenges

The workshop will address specific challenges such as:

- Foundations and Expressiveness of System Description Formalisms:
  - *basic concepts,*
  - *component interaction,*
  - *resource modeling (energy, memory, time, ...),*
  - *combining synchrony vs. asynchrony, event-triggered/data-triggered/time triggered, separation of concerns;*
- Component-based Design, Methods and Tools:
  - *analysis methods (compositional*

Accepted Talks

- 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**
- Ananda Basu, Marius Bozga and Joseph Sifakis, VERIMAG. Gregor Gößler, INRIA Rhône-Alpes: **Component-based Construction of Real-time Systems in BIP**
- Janos Sztipanovits (Vanderbilt University and ISIS): **Towards the Compositional Specification of Semantics for Heterogeneous Domain-Specific Modeling Languages**
- Cheng-Yao Chen, Jason Schlessman, and Wayne Wolf, Princeton University: **Towards Accessible Real-Time Distributed Embedded Vision Middleware**
- Kai Richter and Marek Jersak, Symtavision GmbH. Arne Hamann and Rolf Ernst, **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 Com Objectives ponents in Heterogeneous Distributed Real-Time Systems**
- Sankalita Saha, Dong-Ik. Ko, and Shuvra. S. Bhattacharyya, University of Maryland: **A Meta-modeling Framework for Dynamic Reconfiguration of Dataflow Graphs**
- Thomas A. Henzinger, EPFL and UC Berkeley. Slobodan Matic, UC Berkeley: **An Interface Algebra for Real-Time Process Graphs**
- Lothar Thiele, Ernesto Wandeler, and Nikolay Stoimenov, ETH Zurich: **Real-Time Interfaces for Composing Real-time Systems**
- Abhik Roychoudhury and P.S. Thiagarajan, National University of Singapore: **A Verification Framework for Interacting Process Classes**
- Ingo Stierand and Werner Damm, University of Oldenburg: **Cyclic Timed Interfaces**

Artist2 Newsletter

Objectives

Provide a complementary media for Artist2 dissemination, aiming to increase awareness for a very wide audience.

- The newsletter is published approximately every 4 months
  There were 2 issues in Year 2, starting Feb 2006.
  Next issue is planned for the end of November.
- Wide distribution – to more than 3500 contacts worldwide
- We have received a very positive feedback – regularly generating requests for subscriptions (and a very small number of unsubscriptions).

Plans for Year 3

For Year 3 the newsletter will be extended to include:

- Highlights from the Artist2 results
- Articles on major R&D projects
- Interviews