Information Society Technologies

ARTIST2 – Year 1 Review

Grenoble, October 3rd-4th, 2005

Activity *NoE Integration*

Adaptive Real-Time, HRT and Control

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Overview

- Three clusters:
  - Adaptive Real-Time,
  - Hard Real-Time
  - Control

- The objective is to integrate the work performed within the three clusters on
  - computational models for embedded control systems
  - control techniques for providing flexibility in embedded systems

- Strong connection to the cluster activities, e.g.,
  - RT Techniques in Control System Implementation (Control)
  - Control for RT Computing (Control)
  - Flexible Scheduling Technologies (ART)
  - Adaptive Resource Management for Consumer Electronics (ART)

Year 1 activities

Objectives

- The long term objective is to develop new computational models and methods based on well established control theory for resource-constrained real-time applications.

- The 18-month objective is to demonstrate that applications of diverse type can be specified in terms of resource-aware tasks, and scheduling algorithms can be made adaptive by means of control schemes.

Year 1 activities

Achievements & Ongoing Work

- Mälardalen and Lund
  - combining the jitter margin concept with flexible scheduling framework
- Lund and Ericsson
  - extending the control server model to distributed systems
- Pavia/Pisa and Lund
  - added support for the control server in the SHARK kernel
  - work on elastic task model in SHARK
- Lund and Mälardalen/UPC
  - feedback scheduling of controller tasks
- CTU, UPVLC and Pavia/Pisa
  - CBS, nano-kernel, and real-time control demonstrators based on the OCERA platform
- Lund and HRT
  - contribution to diagnosis workshop

Year 1 activities

Interaction & Building Excellence

- Interaction between partners:
  - good
  - bottom-up approach
  - Meetings:
    - *Kick-off in Lisbon*
    - *RTC2005 in Mallorca*
    - *Lund Workshop*
- Building excellence
  - Joint contributions to workshops and summer schools
    - The ARTIST seminar on adaptive real-time systems, with emphasis on real-time control systems organized by the Adaptive Real-time cluster and held at UPC.
    - Juan Antonio de la Puente from UPM (Adaptive RT) lectured at the Artist2 graduate course on embedded control systems
    - Luis Almeida lectured at the IFAC summer school on control, computing and communication co-organized by the Artist2 control cluster
    - A planned joint summer school between ART and Control on real-time and control in Aveiro postponed due to lack of funding.

Year 1 activities

Management Perspectives

- The focus on the cluster activities (e.g., the roadmaps for the control cluster) has had a somewhat negative effect on this activity
  - still a lot of integration has been initiated
- It is mainly ART and Control that have integrated
  - HRT has the smallest participation
- No activities including all three clusters
  - is it necessary?
  - is it possible?
- Plans for the future:
  - put more emphasis on this activity
  - involve the new RT Components cluster better, or to remove them

    to be decided

18 Month Perspective

Work Planned for the next 18 months

- Continue the integration activities that already have started
- Identify and start new activities that possibly also involve the RT Components cluster
- Develop a “demonstrator” that exemplifies how applications of diverse type can be specified in terms of resource-aware tasks, and that scheduling algorithms can be made adaptive by means of control schemes.
- Joint summer school