17th Euromicro Conference on Real-Time Systems

ECRTS

Palma de Mallorca. Spain. 6 – 8 July 2005

ECRTS Conference at a glance

Tuesday 5th July Satellite workshops		Wednesday 6th July		Thursday 7th July		Friday 8th July	
09:00	Bus to Workshops venue departs from Hotel Saratoga	09:15	Registration at *Fundació "la Caixa"*	09:15	Session 4	10:00	Session 7a
09:30	Registration	09:30	Opening remarks	11:15	Coffee break	11:00	Coffee break
10:00	Session 1	09:45	Session 1	11:45	Session 5	11:30	Session 7b
11:30	Coffee break	11:15	Coffee break	13:15	Lunch	12:30	Keynote 3
12:00	Session 2	11:45	Session 2	14:45	Session 6	13:00	Lunch
13:30	Lunch	13:15	Lunch	16:45	Coffee break	14:30	WIP session 2
15:00	Session 3	14:45	Keynote 1	17:15	Keynote 2	15:30	WIP poster and coffee break
16:30[1]	Coffee break	15:45	WIP session 1	19:30	Excursion and banquet. Bus departs from *Fundació "la Caixa"*	16:00	Session 8
17:00	Session 4	16:45	WIP poster and coffee break			17:30	Closing remarks
19:00	Bus departs back to Hotel Saratoga.	17:15	Session 3				
		19:30	Welcome cocktail. Bus departs from *Fundació "la Caixa"*				

[1] Times of coffee breaks may differ between workshops.

Workshops

WCET: 5th International Workshop on Worst-Case Execution Time Analysis.
RTN: 4th International Workshop on Real-Time Networks.
RTC: 1st International Workshop on Real-Time Control.
OSPERT: 1st International Workshop on Operating System Platforms for Embedded Real-Time Systems.

Keynote Speakers

Keynote 1:   Johan Eker, Ericsson Mobile Platforms, Sweden.
Keynote 2:   Jan Lindblad, ENEA, Sweden.
Keynote 3:   Mercè Griera i Fisa, European Commission, Belgium.

Sessions

Session 1:   Energy-Aware Computing.
Session 2:   Worst-Case Execution Time Analysis.
Session 3:   Programming Languages, Modelling and Validation Techniques.
Session 4:   Operating Systems Support.
Session 5:   Scheduling and Schedulability Analysis.
Session 6:   Quality of Service Support and Wireless Sensor Networks.
Session 7:   Multiprocessor Systems.
Session 8:   Applications of Real-Time Systems.
WIP 1,2:   Work in Progress Sessions.

Social Events

Welcome cocktail. Wednesday 6th. Buses depart at 19:30 from *Fundació "la Caixa"*.
Excursion to *Monestir de Miramar*. Thursday 7th. Buses depart at 19:30 from *Fundació "la Caixa"*.
Conference banquet at *Restaurant Club Nàutic de Palma*. Thursday 7th at 21:30.
(additional tickets for the banquet can be purchased at the registration desk)

Addresses of interest

ECRTS Workshops Venue:
Edifici Jovellanos. Universitat de les Illes Balears.
Carretera de Valldemosa. Km 7.5. Palma

ECRTS Conference Venue:
Fundació "la Caixa".
Plaça Weyler, 3. Palma

Lunch (Wednesday to Friday):
Restaurant "Rodeo Grill", Plaça Rosselló. Palma. Tel: 971-721900
10 minute walk from the conference venue

Internet

Check details at reception.

Welcome to the 17th Euromicro Conference on Real-Time Systems.

Palma de Mallorca, our host city, is regarded as one of the gems of the Mediterranean Sea. Its strategic location has made it subject of numerous invasions throughout the centuries that have enriched its cultural and historical heritage. The ideal climate conditions and high quality of services makes Mallorca a preferred destination which we hope you will really enjoy.

We are indebted to *Fundació "la Caixa"* who kindly enabled us to host the conference within their walls. The building, formerly known as the *Gran Hotel*, is one of the most important examples of Modernist architecture in the island. It was acquired and restored by the *Caixa de Pensions* "la Caixa" who converted it into a cultural centre that now hosts an auditorium that offers a varied programme of concerts and other cultural and scientific events, a library specialising in contemporary art, several exhibition spaces normally used by temporal art shows and the Anglada Camarassa collection.

The ECRTS conference is complemented this year by two work in progress sessions, three keynote speakers, and four satellite workshops. The social events include a welcome cocktail with a tour of Palma on the Wednesday, and an excursion to the north coast followed by the conference banquet back in Palma on Thursday.

The organisation of this event would not have been possible without the effort and hard work of many people. Most important are the authors who this year submitted a record number of papers. I would also like to thank our keynote speakers Johan Eker from Ericsson Mobile Platforms, Jan Lindblad from ENEA, and Mercè Griera i Fisa, Project Officer at the Embedded Systems Unit of the IST Programme; Eduardo Tovar, the program chair, who has done an excellent job putting together a very interesting program that we all hope you will enjoy; the different workshop and WIP chairs for their work on consolidating the satellite workshops and WIP session as one of the key events of the ECRTS conference; the Euromicro organisation for providing the support for registration; Gerhard Fohler, the alma mater behind ECRTS that seems to be on top of everything; Julián Proenza and Guillermo Rodríguez-Navas from the *Universitat de les Illes Balears* and Margalida Homar from the *Fundació Universitat.* Who as local organisers have done an excellent job in setting up the conference, hotels and social events; and finally our main sponsors, the *Fundació "la Caixa",* the *Universitat de les Illes Balears*, and *Telefónica*.

I hope you enjoy the conference and your stay in Palma,

Dr. Guillem Bernat.
ECRTS 05 General Chair

Local Information

The Balearic Islands are situated on the western Mediterranean basin about 200 km. from mainland Spain. Mallorca is the largest island, followed by Menorca, Ibiza and Formentera. Palma is the capital of the isles with a population of circa 380,000 people. The official languages of the Balearics Island are Catalan and Spanish, although German and English are widely spoken.

Mallorca has received influences from several civilisations through history, the Romans and then the Arabs invaded it naming it *Madina Mayurqa*. The city still preserves evidence of these historic periods. In 1229, Palma was conquered by Jaume I, naming it *Ciutat de Mallorca*. Palma became a major trading port until the 16th century when plague, foreign rebellions and frequent attacks by Turkish pirates and the Berbers led to a period of decline until the end of the 17th Century. In the 18th and 19th centuries the city saw a period of development and growth in population and size. The 1950's marked the prelude of the tourist phenomenon which has transformed the city and the islands. The number of tourists rose from 500,000 in 1960 to a staggering 6,000,000 in 1997. This put the Balearics Islands into the top position in Spain with respect to the gross domestic product per inhabitant and one of the few communities in Spain to exceed the European Union average.

Traffic in Palma is usually very heavy. A good option is the bus transport system. You can buy a *bonobus* in most Newsagents, and "Estancos". Taxis are usually more expensive, however, very convenient as there are lots of taxi stops around Palma. Parking in most of the streets in the centre of Palma is controlled by the ORA (watch out for blue parking lines). You need to buy a ticket from ticket machines and display it in your car. Alternatively, there are a considerable number of underground parking spaces at competitive prices.

The conference venue and hotels are in the heart of the commercial district in Palma. Most shops open in the morning at around 10:30am and close at 1:30pm. They open in the afternoon at around 4:30 pm until 8:00 pm. Most restaurants open for dinner at around 7:00 pm or 8:00 pm until late in the night.

The gastronomy of Mallorca is excellent and very varied. Mallorcan specialities include the *Sobrassada*, a traditional sausage meat characterised by its red color; and the *Ensaimada* (see picture), a spiral shaped sweet bun with powdered sugar on top and filling. There are plenty of restaurants and places to enjoy food and drink around the conference venue and hotels. Tipping (5-10%) is recommended but not compulsory and usually indicates appreciation for a good service. IVA (VAT in Spain) is generally included in the quoted price.

Palma is very safe but do take common sense precautions. Look after your belongings and do not leave your possessions unattended.

Embedded Software for Mobile Terminals.

Johan Eker

Abstract: Mobile terminals today are getting more complex by the hour. Features are added at an unprecedented speed and the code base is constantly increasing.

Embedded software for consumer electronics is getting increasingly complex, with a mix of real-time and desktop like features. A 3G terminal consists of several million lines of code supporting use-cases with a large number of parallel activities. With advanced user interfaces and applications, on the surface, they remind of desktop systems. However, it is very much about traditional embedded programming, where CPU cycles, memory, and power are scarce resources, and hand coded assembler is necessary to get the desired performance. This is a time consuming and fragile process. This new, extended embedded space puts high strains on the currently available development tool chains and methodologies. The possibilities for embedded systems to evolve and become more reliable, while yet more complex, to some extent depend on what the next generation real-time operating systems and implementation tools have to offer. The embedded world is in many respects stuck with technology originating in the early 70s, e.g. fixed priority scheduling and the C programming language. New tools and ideas are needed to increase productivity, but most importantly, performance.

Bio: Johan Eker is a member of the research group at Ericsson Mobile Platforms in Lund, Sweden, with a focus on embedded real-time software for consumer electronics. He received his Masters in Engineering Physics in 1994 and his PhD in Automatic Control 1999, both at Lund University. The thesis dealt with real-time and control system co-design. In 2000 at connectBlue he worked with wireless networked control system over Bluetooth, and after which he joined the Ptolemy group at University of California at Berkeley in 2001, where he looked at system level components and programming languages. Recent research involves computational models for real-time tasks. He has been with Ericsson Research since 2003.

Overwhelming Complexity

Jan Lindblad

Abstract: The number of embedded systems around us is increasing rapidly, and more and more sensitive applications are entrusted embedded systems. The cost of failure is increasing. On the other hand, the system complexity increases as devices get integrated and start to communicate. The analyzability is going down, the cost of testing sky rocketing. Movement in several directions will be necessary to counter these developments:
- We need to raise the abstraction level for systems programmers
- We need methods to analyze and test large systems
- We need the systems to handle unforeseen situations autonomously

Bio: Jan is System Architect at Enea Embedded Technology, working as the System Manager for the OSE family of embedded operating systems. Previous experiences include Technical Product Marketing and Technical Sales. Before joining Enea, Jan engineered fault tolerant software platforms at Ericsson Software Technology.

Real-Time and Embedded Systems: Research Opportunities in the IST Thematic Priority of the 6FP

Mercè Griera i Fisa

Abstract: The 5th IST call for proposals was published on 18th May; the closing date for submitting proposals is 21st September 2005. About 70M euro are reserved for a Strategic Objective on Embedded Systems with a twofold focus: Systems Design and Networked Embedded Systems. The lecture will present the challenges in this research area, the portfolio of Community funded ongoing projects and the details of the Call. The objective is to clarify to potential proposers the opportunities offered by the Call.

Bio: Mercè Griera is project officer at the European Commission's Information Society and Media Directorate General. She works in the Six Framework Programme for Research and Development, concretely in the area of Embedded Systems. She entered the Commission in 1993 in the area of Research Networking, she moved to High Performance Computing and Networking and to Communications Technologies. Before joining the European Commission, she was technical director of CAETI (Generalitat de Catalunya) and lecturer and researcher at the Autonomous University of Barcelona.
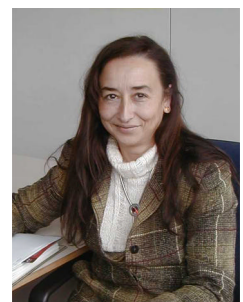
Conference programme

Wednesday, July 6

09:15 – 09:45	Registration at *Fundació "la Caixa"*.
09:30 – 09:45	Welcome and Opening Remarks.
09:45 – 11:15	S1: Energy-Aware Computing. Chair: Gerhard Fohler.

Speed Modulation in Energy-Aware Real-Time Systems.
E. Bini, G. Buttazzo, G. Lipari; Scuola Superiore Sant'Anna and University of Pavia, Italy.

Energy-Aware Memory Firewalling for QoS-Sensitive Applications.
A. Eswaran, R. Rajkumar; Carnegie Mellon University, USA.

Energy Aware Non-preemptive Scheduling for Hard Real-time Systems.
R. Jejurikar, R. Gupta; Univ. of California at Irvine and Univ. of California at San Diego. USA.

11:15 – 11:45	Coffee break.
11:45 – 13:15	S2: Worst-Case Execution Time Analysis. Chair: Peter Puschner.

A WCET-Oriented Static Branch Prediction Scheme for Real-time Systems.
F. Bodin, I. Puaut; IRISA, France.

Scheduling Analysis of Real-time Systems with Precise Modeling of Cache Related Preemption Delay.
J. Staschulat, S. Schliecker, R. Ernst; University of Braunschweig, Germany.

Cache Contents Selection for Statically-locked Instruction Caches: an Algorithm Comparison.
A. Campoy, I. Puaut, A. Ivars, J. Mataix; Technical University of Valencia, Spain and IRISA, France.

13:15 – 14:45	Lunch break
	Restaurant Rodeo Grill.
14:45 – 15:45	Keynote Address 1. Chair: Eduardo Tovar.

Embedded Software for Mobile Terminals.
Johan Eker; Ericsson Mobile Platforms AB.

15:45 – 16:45	Work-In-Progress Session 1. Chair: Isabelle Puaut.
	(See WIP program)
16:45 – 17:15	WIP Poster Session 1 and coffee break.
17:15 – 18:15	S3: Programming Languages, Modeling and Validation Techniques. Chair: Luís Miguel Pinho.

On the Automated Generation of Ravenscar-compliant Source Code.
M. Bordin, T. Vardanega; University of Padua, Italy.

Component-Based Approach to Run-Time Kernel Specification and Verification.
G. Naeser, K. Lundqvist; Mälardalen University, Sweden and MIT, USA.

19:30	Welcome Cocktail.
	Bus departs from *Fundació "la Caixa"*.

Thursday, July 7

9:15 – 11:15	Session 4: Operating Systems Support. Chair: Sanjoy Baruah.

A **Space-Optimal Wait-Free Real-Time Synchronization Protocol.**
H. Cho, B. Ravindran, E. Douglas Jensen; Virginia Tech and The MITRE Corporation, USA.

Fast Component Interaction for Real-Time Systems.
U. Steinberg, J. Wolter, H. Härtig; Technical University of Dresden, Germany.

Non-Preemptive Interrupt Scheduling for Safe Reuse of Legacy Drivers in Real-Time Systems.
T. Fachinetti, G. Buttazzo, M. Marinoni, G. Guidi; University of Pavia, Italy.

Non-blocking Deterministic Replacement of Functionality, Timing, and Data-Flow for Hard Real-Time Systems at Runtime.
S. Fischmeister, K. Winkler; University of Pennsylvania, USA and University of Salzburg, Austria.

11:15 – 11:45	Coffee break.
11:45 – 13:15	Session 5: Scheduling and Schedulability Analysis. Chair: Giorgio Buttazzo.

A Fully Polynomial-Time Approximation Scheme for Feasibility Analysis in Static-Priority Systems with Arbitrary Relative Deadlines.
N. Fisher, S. Baruah; University of North Carolina at Chapel Hill, USA.

Fast and Tight Response-Times for Tasks with Offsets.
J. Mäki-Turja, M. Nolin; Mälardalen University, Sweden.

The Limited-Preemption Uniprocessor Scheduling of Sporadic Task Systems.
S. Baruah; University of North Carolina at Chapel Hill, USA.

13:15 – 14:45 Lunch break.
Restaurant Rodeo Grill.

14:45 – 16:45 Session 6: Quality of Service Support and Wireless Sensor Networks. Chair: Luis Almeida.

Spare CASH: Reclaiming Holes to Minimize Aperiodic Response Times in a Firm Real-Time Environment.
D. Thomas, S. Gopalakrishnan, M. Caccamo, C-H Lee; Univ. of Illinois at Urbana-Champaign, USA.

Scheduling Tasks with Markov-Chain Based Constraints.
D. Liu, X. Hu, M. Lemmon, Q. Ling; University of Notre Dame, USA.

Real-time Scheduling for Data Stream Management Systems.
S. Schmidt, T. Legler, D. Schaller, W. Lehner; Dresden University of Technology, Germany.

A Robust Implicit Access Protocol for Real-Time Wireless Collaboration.
T. Crenshaw, A. Tirumala, S. Hoke, M. Caccamo; University of Illinois at Urbana-Champaign, USA.

16:45 – 17:15 Coffee break.

17:15 – 18:15 Keynote Address 2. Chair: Guillem Bernat.

Overwhelming Complexity.
Jan Lindblad; ENEA AB. Sweden.

19:30 – Excursion and Banquet.

Bus departs from *Fundació "la Caixa"*.

Friday, July 8

10:00 – 11:00 Session 7a: Multiprocessor Systems. Chair: Michael Gonzalez-Harbour.

Bounding Worst-Case Access Times in Modern Multiprocessor Systems .
J. Stohr, Al. von Bülow, G. Färber; Technical University of Munich, Germany.

An EDF-based Scheduling Algorithm for Multiprocessor Soft Real-Time Systems.
J. H. Anderson, V. Bud, U. Maheswari C. Devi; University of North Carolina at Chapel Hill, USA.

11:00 – 11:30 Coffee break.

11:30 – 12:30 Session 7b: Multiprocessor Systems. Chair: Michael Gonzalez-Harbour.

Improved Schedulability Analysis of EDF on Multiprocessor Platforms.
M. Bertogna, M. Cirinei, G. Lipari; Scuola Superiore Sant'Anna, Italy.

Task Assignment on Uniform Heterogeneous Multiprocessors.
S. Funk, S. Baruah; Univ. of Georgia at Athens and Univ. of North Carolina at Chapel Hill, USA.

12:30 – 13:00 Keynote Address. Chair: Gerhard Fohler.

Real-Time and Embedded Systems: Research Opportunities in the IST Thematic Priority of the 6FP.
Mercè Griera I Fisa, Project Officer, Embedded Systems Unit of the IST Programme, European Commission - DG Information Society.

13:00 – 14:30 Lunch break.

14:30 – 15:30 Work-In-Progress Session 2. Chair: Isabelle Puaut.

(see WIP program)

15:30 – 16:00 WIP Poster Session 2 and coffee break.

16:00 – 17:30 Session 8: Applications of Real-time Computing. Chair: Jean-Dominique Decotignie.

A Similarity-aware Multiversion Concurrency Control and Updating Algorithm for Up-to-date Snapshots of Data.
T. Gustafsson, H. Hallqvist, J. Hansson; Linköping University, Sweden.

A Performance and Schedulability Analysis of an Autonomous Mobile Robot.
A. Qadi, S. Goddard, J. Huang, S. Farritor; University of Nebraska at Lincoln, USA.

Applying Static WCET Analysis to Automotive Communication Software.
S. Byhlin, A. Ermedahl, J. Gustafsson, Björn Lisper; Mälardalen University, Sweden.

17:30 Closing remarks.

"Work in Progress" Programme

WIP Session 1: Wednesday, July 6th. 15:45 – 16:45

Industrial requirements in development of embedded real-time systems - interviews with senior designers.
K. Hänninen, J. Mäki-Turja and M. Nolin. Mälardalen University, Sweden.

Market enabler for retargetable COTS components in embedded domain.
S. Robert, A. Radermacher, S. Gérard, F. Terrier, A. Fouillart, V. Watine, O. Hachet, V. Seignole. CEA Saclay and Thales Communications, France.

Probabilistic analysis and predictions of component-based real-time systems.
A. Möller, M Nolin, I. Peake and H. W. Schmidt Mälardalen Univ., Sweden and Monash Univ. Australia.

Extended global dual-priority algorithm for multiprocessor scheduling in hard real-time systems.
J. M. Banús, A. Arenas and J. Labarta. Universitat Politècnica de Catalunya, Spain.

Towards best-case response times of real-time tasks under fixed-priority scheduling with deferred preemption.
R. J. Bril and W.F.J. Verhaegh. Technische Univ. Eindoven and Philips Research Labs, Eindhoven, The Netherlands.

On the design and schedulability analysis of distributed object-oriented real-time systems.
A. Gherbi and F. Khendek. Concordia University, Montreal, Canada.

How to solve allocation problems with constraint programming.
P. Hladik, H. Cambazard, A. Deplanche and N. Jussien. IRCCyn and Ecole des Mines de Nantes, Nantes, France.

MetaC and its use for automated source code instrumentation of C programs for real-time analysis.
T. Maier-Komor, A. von Bülow and G. Färber. Technische Universität München, Germany.

A two-tiered architecture for real-time communications in large-scale sensor networks: research challenges.
A. Koubaa and M. Alves. Instituto Politécnico do Porto, Porto, Portugal.

WIP Session 2: Friday, July 8th. 14:30 -15:30

The impact of scheduler overhead on the performance of mobile, embedded real-time systems.
H. Wu, B. Ravindran and E. Douglas Jensen. Virginia Tech and The MITRE Corporation, USA.

Implementation of real-time communication capabilities on RTLinux-GPL systems.
J. V. Sala, J. Vila, S. Pérez and J.A. Alegre. Polytechnical University of Valencia, Spain.

Towards a characterization of real-time streaming systems.
M.A. Weffers-Albu, J.J. Lukkieb abd P.D.V.v.d. Stok Technische Univ.Eindoven and Philips Research Labs, Eindhoven, The Netherlands.

Insights on real time systems architecture modelling for a software engineering viewpoint.
F. Loiret and D. Servat. CEA and INRIA, France.

Efficient system-level testing of embedded real-time software.
D. Sundmark, A. Petterson, S. Eldh, M. Ekman and H. Thane. Mälardalen Univ. and Bombardier Transportation, Sweden.

Dealing with real-time aspects within the Polychronous framework.
A. Gamatié, T. Gautier, P. Le Guernic and J. P. Talpin. IRISA, Rennes, France.

CyNC - towards a general tool for performance analysis of complex distributed real-time systems.
H. Schioler, J. Jessen, J. Dalsgaard Nielsen and K. G. Larsen. Aalborg University, Denmark.

Memory demanding periodic real-time applications on FPGA computers.
K. Danne University of Paderborn, Germany.

Workshop Programmes

5th Intl. Workshop on Worst-Case Execution Time Analysis. WCET 2005. Chair: Reinhard Willhelm.

09:00	Bus to Workshop venue departs from Hotel Saratoga.
09:30 - 10:00	Registration.
10:00 - 11:30	Session 1: Measurement-based methods for WCET determination. Chair: Reinhard Wilhelm.

Issues using the Nexus Interface for Measurement-Based WCET Analysis.
A. Betts, G. Bernat, University of York, UK.

Safe Meaurement-based WCET Estimation.
J. F. Deverge, I. Puaut, Université de Rennes, France.

WCET Measurement using modified path testing.
N. Williams, Commissariat à l'Energie Atomique, CEA, France.

11:30 - 12:00	Coffee break.
12:00 - 13:30	Session 2: Industrial Experience and Education. Chair: Lothar Thiele, ETH Zürich.

Computing the WCET of an Avionics Program by Abstract Interpretation.
J. Souyris, E. le Pavec, G. Himbert, V. Jégu , G. Borios and R. Heckmann, Airbus France, Atos Origin Integration and AbsInt GmbH, Germany.

Experiences from Industrial WCET Analysis Case Studies.
A. Ermedahl, J. Gustafsson, B. Lisper, Mälardalen University, Sweden.

Using a WCET Analysis Tool in Real-Time Systems Education.
S. Petersson, A. Ermedahl, A. Pettersson, D. Sundmark and N. Holsti , Mälardalen University, Sweden and Tidorium Ltd, Helsinki, Finland.

13:30 - 15:00	Lunch break.
15:00 - 16:45	Session 3: Modeling and Compiler Support. Chair: Björn Lisper.

Analysis of Memory Latencies in Multi-Processor Systems.
J. Staschulat, S. Schiecker, M. Ivers, R. Ernst, Technical University of Braunschweig, Germany.

Efficient Analysis of Pipeline Models for WCET Computation.
S. Wilhelm, AbsInt GmbH and Saarland University, Germany.

Compiler-Support for Worst-Case Execution Time Analysis of Optimized Code.
Raimund Kirner, TU Wien, Austria.

Exploiting Branch Constraints without Explicit Path Enumeration.
T. Chen, T. Mitra, A. Roychoudhury, V. Suhendra, School of Computing, National University of Singapore.

16:45 - 17:15	Coffee break.
17:15 - 18:15	Invited Talk.

Composable Real-Time Analysis.
Lothar Thiele, ETH Zürich.

19:00 -	Bus departs from *Edifici Jovellanos* back to Hotel Saratoga.

4th Intl. Workshop on Real-Time Networks. RTN 2005. Chair Jörg Kaiser.

09:00	Bus to Workshop venue departs from Hotel Saratoga.
09:30 - 10:00	Registration.
10:00 - 11:30	Session 1: End-to-end QoS in real-time systems. Chair: Thilo Sauter.

Welcome

IP Quality of Service for Soft Real-Time Applications.
K. Channakeshava, K.S. Phanse, L.A. DaSilva, B. Ravindran, S.F. Midkiff, D.E. Jensen. Virginia Tech, Virginia USA, Lulea University of Technology, Sweden and MITRE corporation. USA

Adding Contract-Based Reservation Services to a Hard Real-Time Ethernet Protocol.
M. Gonzalez-Harbour, J.M. Martinez, J.L. Campos, J.J. Guitrrez, J.L. Medina. Univ. de Cantabria. Spain.

11:30 - 12:00	Coffee break.

12:00 - 13:30	Session 2: Media-access and clock synchronization. Chair: Lucia Lo Bello.
	High Priority Traffic Separation in Shared Ethernet Networks. C. R. Moraes, F. Vasques. University of Porto. Portugal.
	Synchronized access networks. C. Brandauer, P. Dorfinger. Salzburg Research, Austria.
	IEEE 1588 RT Networks with Hybrid Master Group Enhancements. G. Gaderer, T. Sauter, P. Loschmidt. Vienna University of Technology and Austrian Academy of Sciences, Austria.
13:30 - 15:00	Lunch break.
15:00 - 16:30	Session 3: Wireless communication. Chair: Jean-Dominique Decotignie.
	Wireless automotive communication. T. Nolte, H. Hansson, L. Lo Bello., Mälardalen University, Sweden and University of Catania. Italy.
	On the effectiveness of IEEE802.11 broadcasts for Real-Time Communication. F. Santos, L. Almeida. Instituto Politécnico de Coimbra and Universidade de Aveiro. Portugal.
16:30 - 17:00	Coffee break.
17:00 - 18:30	Session 4: Wireless communication. Chair: Julian Proenza.
	Approaches to support Real-Time traffic over Bluetooth. L. Lo Bello, M. Collotta1, O. Mirabella, T. Nolte. University of Catania, Italy and Mälardalen University, Sweden.
	Networked Real-Time RFID in industrial control. W. Wang. Cambridge Autio-ID Lab. Cambridge, UK.
19:00 -	Bus departs *from Edifici Jovellanos* back to Hotel Saratoga.

1st Intl. Workshop on Real-Time and Control. RTC 2005. Chair: Karl-Erik Arzen.

09:00	Bus to Workshop venue departs from Hotel Saratoga.
09:30 - 10:00	Registration.
10:00 - 11:30	Session 1: Real-Time Control.
	The ARTIST2 roadmap on real-time control. K.-E. Årzén. Lund University. Sweden.
	Workshop discussion on research directions in real-time control.
11:30 - 12:00	Coffee break.
12:00 - 13:30	Session 2: Co-Design Tools.
	A survey of co-design tools for control, computing, and communication. D. Henriksson, O. Redell, J. El-Khoury, M. Törngren, K.-E. Årzén , Lund Univ. and KTH Sweden.
	Workshop discussion on needs and requirments on co-design tool.
13:30 - 15:00	Lunch break.
15:00 - 16:45	Session 3: Submitted Papers Session. Chair: Jan Broenink.
	Key aspects for co-designing real-time and control systems. M. Velasco, P. Martí, R. Castañé, R. Villa and J. M. Fuertes, UPV Barcelona, Spain.
	Platooning test and demonstration platform for analyzing embedded real-time algorithms for control applications. W. Kubinger, J. Kogler, H. Hemetsberger, R. Isaacs and J. Langer, Austrian Research Center and Upper Austria Univ. of Applied Sciences, Austria.
	Canonical approach to derive and enforce real-time conditions. D. Zöbel, Univ Koblenz-Landau, Germany.
	Stability Analysis of Feedback Controlled Reservation-based CPU Scheduler. I. Song, S. Kim, and F. Karray, Univ of Waterloo, Canada.
	Simulation Environment for Investigating the Impacts of Time-Triggered Communication on a Distributed Vehicle Dynamics Control System. A. Albert, B. Pietsch and F. Voetz, Robert Bosch GmbH and Univ of Hanover, Germany.
16:45 - 17:15	Coffee break.
17:15 - 18:15	Control of RT Computing Systems.

Invited talk: Control-based approaches to CPU resource management
Giuseppe Lipari, Giorgio Buttazzo, Scuola Superiore Sant'Anna, and Univ. Pavia, Italy.

19:00 -   Bus departs from *Edifici Jovellanos* back to Hotel Saratoga.

1st Intl. Workshop on Operating Systems Platforms for Embedded Real-Time applications. OSPERT 2005. Chair Guiseppe Lipari.

09:00   Bus to Workshop Venue departs from Hotel Saratoga

09:30 - 10:00   Registration.

10:00 - 11:30   Session 1: Kernel Architectures for Embedded Systems.

Panel introduction.

Challenges for scheduling media applications on a multiprocessor SoC.
C. M. Otero Pérez, G. van Doren. Philips Research, Eindhoven.

Impact of Embedded Systems Evolution on RTOS Use and Design.
D. Andrews, I. Bate, T. Nolte, C. M. Otero Perez, S. M. Petters. University of York, Philips Research Lab, Eindhoven, The Netherlands, NICTA, Australia.

Operating Systems and Supporting Architectures for Embedded Real-time Systems.
N. Audsley, R. Gao, A. Patil, P. Usher, J. Withman. University of York.

Open discussion.

11:30 – 12:00   Coffe break.

12:00 – 13:30   Session 2: RTOS Architectures and APIs – I.

The FIRST API
Michael González-Harbor. Universidad de Cantabria. Spain.

The need for configurable and flexible scheduling in a RTOS aspiring to solve contemporary problems.
Thorbjorn Jemander. ENEA Epact. Sweden.

An overview of the XtratuM nanokernel.
M. Masmano, I. Ripoll, and A. Crespo. Universitat Politècnica de Valencia. Spain.

Kernel Support for Energy Management in Wireless Mobile Ad-Hoc Networks.
M. Marinoni, G. Buttazzo, T. Fachinetti, G. Franchino. University of Pavia. Italy.

13:30 – 15:00   Lunch break.

15:00 – 16:30   Session 3: Real-Time in general purpouse OS.

Panel introduction.

Variable-Rate QoS in the OS Network Subsystem.
H. Cheng, X. Liu, and S. Goddard. University of Nebraska-Lincoln, USA.

Developing a Complete Integrated Real-Time System.
S. A. Brandt, S. Banachowski, C. Lin, and J. Wu. Univ. California, USA.

A Unified Framework for multiple type resource scheduling with QoS guarantees.
L. Palopoli, P. Valente, T. Cucinotta, L. Marzario, A. Mancina. Scuola Superiore Sant'Anna. Italy.

Open discussion.

16:30 – 17:00   Coffe break.

17:00 – 18:30   Session 4: RTOS Architectures and APIs – II.

Adding new features to the Open Ravenscar Kernel.
S. Urueña, J. A. Pulido, J. A. de la Puente, J. Zamorano. Universidad Politécnica de Madrid, Spain.

The OCERA operating System.
Alfons Crespo. Universitat Politècnica de Valencia. Spain.

Lightweight RTAI for DSPs.
J. Kretzschmar, R. Baumgartl. Technical University chemnitz. Germany.

Power Measurement as the Basis for Power Management
D. C. Snowdon and S. M. Petters. NICTA, Australia.

19:00-   Bus departs from *Edifici Jovellanos* back to Hotel Saratoga.
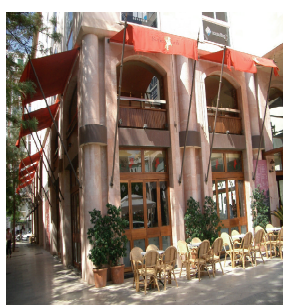
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2- Hotel Jaume III

3- Hotel Palladium

4- Hotel Almudaina

5- Fundacio "La caixa"

6- Rte. Rodeo Grill

7- Cafe Varadero

8- Rte. Club Nautic

1- Palma Airport
2- Palma
3- Universitat Illes Balears (workshop Venue)
4- Edifici Jovellanos (workshop Venue)
5- Excursion. Monastir Miramar

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