



3rd European Congress ERTS

EMBEDDED REAL TIME SOFTWARE



25-27 January 2006
Toulouse, France
Centre de Congrès Pierre Baudis

ADVANCE PROGRAMME



A380 *Born of a vision.*



AIRBUS

PARTNERS



www.embeddedtouch.com

To reduce time to independent information about embedded & real-time systems development technologies, engineers involved in embedded real-time development for many years have imagined offering their past colleagues a database of information streaming from an "a priori" technological intelligence.

The main characteristics of this new service are:

- Analysis and synthesis by specialized engineers, linked with universities, laboratories, advanced research engineers, and highly reputed seminars,
- Thematic classification in categories such as the tools, the methods, the norms, the protocols, the congress,
- Technical and independent point of view, synthesis editorial work,
- Distance from focus information, unbiased view of advertisements,
- Daily up-dated information.



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www.vdi.de

VDI the Association of German Engineers is a financially independent and politically unaffiliated, non-profit making organisation of 126,000 engineers and natural scientists. More than 12,000 of these members work for the VDI in an honorary capacity.

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VDI-FVT - Graf Recke-Str. 84 - D-40239 Düsseldorf - Germany

Tel: +49 (0)211 62 14-445 - Fax: +49 (0)211 62 14-1 - Email: fvf@vdi.de

SPONSORS

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Siemens VDO Automotive is one of the worldwide leading automobile suppliers for electronics, and mechatronics. As a development partner to the automobile industry, the company manufactures products for the engine track, engine steering electronics and injection technology, which improve engine performance and reduce emissions. Information and car communication systems with instrumentation, audio and navigation devices, telematics and multimedia applications to complete cockpits provide a more comfortable drive and improved user friendliness. Siemens VDO products for chassis and bodywork, such as airbags, ABS or access control systems contribute to more safety. Its own retail division sells products for refits for automobiles and trucks, with the main focus on fleet management and audio and navigational systems.

In the financial year (ending 09/04), Siemens VDO Automotive had sales of Euro 9 billion. The company employs over 48 000 people worldwide. In France, the total sales for the same period is 1,44 billion, about 4300 people work in the 10 French sites.



AIRBUS

www.airbus.com

Airbus, an EADS joint Company with BAE SYSTEMS, is a leading aircraft manufacturer with the most modern and comprehensive product line.

Airbus is one of the world's leading aircraft manufacturers, and it consistently captures approximately half or more of all orders for airliners with more than 100 seats.

Airbus' mission is to provide the aircraft best suited to the market's needs and to support these aircraft with the highest quality of service. The Airbus product line comprises 12 aircraft models, from the 100-seat single-aisle A318 jetliner to the 555-seat A380 - which will be the largest civil airliner ever when it enters service in 2006.

VIRTUAL PANEL

ERTS 2006 will be the place to examine the trends of Real-Time software development. EmbeddedTouch.com, the Real-Time Information Agency has interviewed:

- **Thierry Dujardin**, consultant at DECISION,
- **Patrick Cousot**, Professor at ENS Paris (Ecole Normale Supérieure); he is an expert in software verification methods,
- **Thomas Scharnhorst**, Head of Architecture and Concepts at Volkswagen,
- **Jean-Claude Alacoque**, R&D Manager for algorithmic and Real-Time Technology Survey at ALSTOM Transport,
- **Mike Dewalt**, Chief Scientist Aviation systems at Certification Services Inc.

EmbeddedTouch: "How do you today define a Real-Time embedded application software? What are the main constraints?"

Thierry Dujardin: "These are applications for which Real-Time is the main constraint. These applications often manage the systems or personnel security. Their design must take into account safety requirements. Today, the main constraints are the multiple interactions between embedded systems."

Patrick Cousot: "Today embedded software covers a lot of fields such as safety critical software in aeronautics or control/command software in automotive industry or telecommunication software for PDA. Real-Time embedded application software is characterized by security and reliability constraints. The implementation of communication in embedded systems is also a strong trend."

Thomas Scharnhorst: "Today in automotive electronics, as well as in electronics of many other items such as trains and aerospace, there are a lot of computers where the software is strongly embedded very closely to the hardware. Changes of the hardware on one side involve a lot of changes to the software on the other side. Software itself is hardly modular, and is in many items, not independent of the hardware."

EmbeddedTouch: "What are the most significant developments over the last 15 years?"

Jean-Claude Alacoque: "The most significant development is definitely the increase of processor performances followed by the drop in of the ship's cost, followed by the evolution in standalone systems towards distributed and interconnected systems and finally the use of modelling."

EmbeddedTouch: "What might be the most important (or necessary) developments over the next 10 years?"

Thierry Dujardin: "Development methods, modelling and formal verification are the main subjects to deal with in the future. Aeronautics and the military, telecommunications, and automotive industries may get benefits from the sharing of their experiences. A center of excellence incorporating Universities and CNRS research laboratories should be created."

Thomas Scharnhorst: "The future in electronics is still driven by a strong increase in functional demand or demand of functions. These functions are networked and interconnected among each other. They are not locked into one single issue. So a lot of issues are communicating with each other and there is still a lot of potential to offer more functionalities in terms of safety systems and personalization of functions by the customers, and of course still a lot of multimedia and entertainment items."

Patrick Cousot: "Control/command and communication aspects will interpenetrate deeply in the future. In the past, embedded systems managed only one object. Today, we find multiple objects which are managed automatically and communicate together according to the environment. For example, there are a lot of projects in the USA related to vehicles without a pilot like military aircraft."

EmbeddedTouch: "Do RTOS meet industrials needs?"

Patrick Cousot: "Today, the market is dominated by asynchronous systems based on RTOS. This situation is due to the computing history. Multitasking appeared 25 years ago and was widely implemented in classical Operating Systems and RTOS to share tasks and processes. Synchronous systems came later with people developing control/command systems, but today synchronous systems are mainly used for hard Real-Time systems."

Jean-Claude Alacoque: "Industrialist who use RTOS are faced with problems of interrupted management, Real-Time aspects and tasks-scheduling. In the future, RTOS should need fewer CPU resources."

EmbeddedTouch: "Is Open Source software currently used in embedded systems?"

Mike Dewalt: "At first, Open Source looks fairly good but let me tell you about my only experience with them."

Our company once wanted to use Linux in an avionics type application. Linux is an open source code. The code was there but the problem was that there was no design document. It was very hard to use because if there was no design documentation, you couldn't guarantee that the code was equal to the design. There are no real overall requirements for Linux.

I believe that eCOS is an open source RTOS but, again, it doesn't have the documentation required by aeronautical development methods. To use eCOS, somebody would have to reverse engineer it."

EmbeddedTouch: "Which benefits could industrials expect from the major standards in aeronautics, automotive or telecommunication?"

Thomas Scharnhorst: "The strength of Autosar is that the community in terms of automotive OEMs and key suppliers is a world wide initiative. So the leading companies from Japan, US and Europe are taking responsibility. The main weakness is that if you define a standard you cannot fit everybody's needs. But for individual requirements, it can be 100% fulfilled. Any open architecture on such a platform wants to integrate the best of the best, but it cannot of course give respect to any individual requirements."

EmbeddedTouch: "Do you think that a unique method can be used in all fields (aeronautics, aerospace, automotive or telecom)? CMMi for example?"

Mike DeWalt: "CMMi is just an extension of CMM at the integrated level. CMMi is about getting control of process and process improvement. I haven't looked in detail at the CMMi, but I don't believe that CMMi would directly show how good this method is for the development of embedded systems. For example, we in the FAA and the regulatory community globally, don't recognise the CMM or the CMMi as the means of getting approval. There are 5 levels in CMMi. At level 5 you can say: I am wonderful, I am beautiful, I am better than everybody. But that doesn't work in the certification community. If you get to level 2 maybe level 3 it might help you get an approval, because now you have process control. But we don't really recognise and give any credit at all. If you came in with CMM level 5 we would say: Very good, good boy, OK now we are going to get the DO-178B where we can start."

Thomas Scharnhorst: "We are in a period in which we understand more and more about aeronautics, aerospace, automotive and telecom. These industries need more exchange of experiences or standardisation. ERTS 2006 is a good opportunity to understand more from both sides. This process has always existed but it has to be made more transparent in the future and there are needs to cooperate."

The complete interviews are available on the EmbeddedTouch's web site (www.embeddedtouch.com) or on the ERTS 2006 web site (www.erts2006.org).

OVERVIEW & OBJECTIVES

The three engineering societies, SIA, AAAF and SEE, representing automotive, aeronautics and space, are organizing the third edition of the Embedded Real Time Software congress ERTS 2006.

The co-chairing of this congress by AIRBUS and SIEMENS VDO indicates that cross-fertilization and synergies between aerospace and automotive are possible.

2006 is a good time to obtain feedback from recent industrial developments, such as modular avionics, flying with A380 and Autosar, an industrial initiative close to delivering the expected world open standard platform for the vehicle industry. In line with this feedback, the third congress will put special emphasis on lessons learnt in:

- Applying emerging technologies (in industry) such as formal verification.
- Applying increasingly standardized development methods and approaches such as UML and CMM-I.
- Business models for software including topics as Open Source or Embedded Software sold as a stand-alone product.

ERTS 2006 will also be the right time to look into other fields that have solved complex architecture challenges. From space down to subway, from telecom networks to energy distribution, key examples will be explored for the benefit of participants in search of brilliant new ideas.

ERTS 2006 will also provide the opportunity to learn from players in research fields and the newest trends in basic research that we need to consider in our embedded system roadmap, to maintain leadership in this domain.

All these issues and more will be addressed during ERTS 2006 in the form of conference presentations, high-level round tables, or panel discussions.

Last but not least, everybody delivering value in the supply chain of ERTS is invited to exhibit their specific solutions from microcontroller platforms to software modules, case tools, testing and certification as well as engineering services.

We look forward to welcoming you to the historic city of Toulouse for this international and cross-sector industry event which will provide some unforgettable moments as well as some great contacts!

That's the ERTS SPIRIT!

G rard Ladier AAAF / Airbus France
Jean-Luc Mat  SIA / Siemens VDO

ORGANISING



www.sia.fr

The *Soci t  des Ing nieurs de l'Automobile* (the French Society of Automobile Engineers) is a society officially considered as serving the public interest. Its purpose is to represent technical excellence in the automobile industry through its expert and knowledge sharing networks. The SIA draws its members from the ranks of automobile engineers and technicians and all those active in promoting automotive engineering. SIA has 2 500 members and a network of over 8 000 engineers, technicians and research workers behind it.

SIA - 79 rue Jean-Jacques Rousseau - 92158 Suresnes Cedex - France
Tel.: +33 1 41 44 93 70 - Fax: +33 1 41 44 93 79 - email: info@sia.fr



www.aaaf.asso.fr

The *Association A ronautique et Astronautique de France* is the only French society of the aerospace field. AAAF is member of the International Council of Aeronautics Sciences (ICAS), of the international Astronautics Federation (IAF), of the French Mechanics Society (AFM). The first goal of AAAF is to inform all the members about developments in our sector of activity and to show up and to promote the work of our members. The mission of AAAF can be declined as follow: to bring together members and industrial firms, to create contacts between the members themselves, to serve as a major source of information, to provide members with a possibility to represent the members in several national or international societies, to award medals, scrolls and so on...

AAAF - 61, avenue du Ch teau - 78480 VERNEUIL-sur-SEINE - France
Tel: +33 1 39 79 75 15 - Fax: +33 1 39 79 75 27 - email: secr.exec@aaaf.asso.fr



www.see.asso.fr

The SEE (*the French Electrical, Electronics, and Information & Communication Technologies Society*) is a non-profit-making scientific association, directed to the public benefit. The SEE groups its members into 22 Technical Committees and 12 Regional Groups, creating links between them through its Newsletter and website. SEE mission's is to promote French science and technology, as well as create within these two fields meeting opportunities for industrialists, research scientists, teachers, students and trainee engineers both from France and abroad. The SEE thereby organises and co-organises events in its particular fields of competence. These professional national colloquia deal with particular topics and prospects, as well as major international Conferences. Other events include technical visits, evening lectures and training courses.

SEE - 17, rue Hamelin - 75783 PARIS Cedex 16 - France
Tel: +33 1 56 90 37 06 - Fax: +33 1 56 90 37 08 - email: see@see.asso.fr

Organising Committee Members:

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Guy Destarac - AAAF, France

Jean-Louis Guiraud - SEE/ENSICA, France

Jo lle Huneau-Stella - AAAF, France

Christel Seguin - SEE / ONERA, France

Alice Torgue - AAAF / ONERA, France

B atrice Valdayron - SEE, France

Louis-Claude Vrignaud - SIA / Siemens VDO Automotive, France

PROGRAMME COMMITTEE

Congress Co-Chairmen:

G rard Ladier – Airbus, France

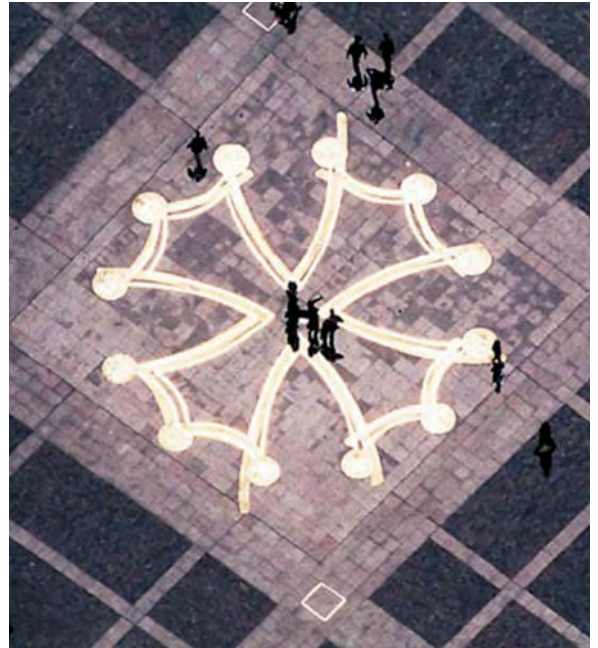
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Emmanuel Ledinot – Dassault Aviation, France
Pierre Malaterre – PSA Peugeot Citro n, France
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Cyrille Rosay – CEAT, France
Thomas Scharnhorst – Volkswagen, Germany
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Ulrich Virnich – Siemens VDO Automotive, Germany
Stefan Voget – Siemens VDO Automotive, Germany
Louis-Claude Vrignaud – Siemens VDO Automotive, France



Programme Committee Secretariat:



IERSET provided logistical support to the Programme committee.

IERSET is an organisation whose primary mission is to conduct cooperative transversal R&D projects involving several partners (industrial companies, public & private research centres) in the various fields of transportation. Airbus, Alstom transport, Alcatel Al nia space, Giat industries, CNES, Renault, Siemens VDO and major research centres are members. IERSET is part of the "Aerospace Valley" Aeronautics, Space and Embedded Systems competitiveness hub given worldwide hub status by the French government in July 2005.

Tel: +33 (0)5 34 63 84 10
Email : ierset@cict.fr
www.ierset.asso.fr

PROGRAMME AT A GLANCE

January 25th

9:00	Opening Session	
9:45	Keynote address Jean-Marc Thomas – Airbus France / Aerospace Valley	
10:45	Exhibition visit / Refreshment break	
11:15	Session 1A: Validation	Session 1B: AADL
12:30	Exhibition visit / Lunch	
14:00	Panel session AUTOSAR – IMA	
15:30	Session 2A: Formal Static Analysis	Session 2B: UML in Practice
16:45	Exhibition visit / Refreshment break	
17:15	Session 3A: Formal Development	Session 3B: UML and Verification
18:30	Cocktail Party at the Exhibition	

January 26th

8:30	Keynote address John Rushby – SRI International	
9:30	Session 4A: Model Checking	Session 4B: WCET Assessment
10:20	Session 5A: Model Transformation	Session 5B: Timeliness Assessment
11:10	Exhibition visit / Refreshment break	
11:40	Session 6A: Model-Based Development	Session 6B: Real Time Networks
13:20	Exhibition visit / Lunch	
14:50	Session 7A: Development Process for Safety	Session 7B: Testing
16:30	Exhibition visit / Refreshment break	
17:00	Session 8A: Process Improvement	Session 8B: Human Machine Interaction
18:40	Exhibition visit	
19:30	Gala Dinner – Hôtel Dieu St Jacques	

January 27th

8:30	Keynote address Kostas Glinos – European Commission	
9:30	Session 9A: Component-Based Approches	Session 9B: Real Time Platforms
10:20	Session 10A: Business Models for Real Time Systems	Session 10B: Real Time Platforms
11:10	Exhibition visit / Refreshment break	
11:40	Session 11A: Business Models: Open Source	Session 11B: Certification
12:55	Closing Session	
13:30	Exhibition visit / Lunch	
15:00	Technical Visits (Optional) Airbus or Siemens VDO Automotive	

The organisers reserve the right to make changes to the programme should they be deemed necessary

KEYNOTE ADDRESS ABSTRACTS

Wednesday, January 25th – 9:45

Welcome of the attendees on behalf of Aerospace Valley

Jean-Marc Thomas – Senior Vice President, General Manager, Airbus France & Co-Project Leader, Aerospace Valley

After presenting what is Aerospace Valley and why this congress is particularly welcome at its heart, a view of the challenges we face in embedded systems/software in the transportation domain will be given.

This will lead to an illustration of why it is useful and necessary for aerospace stakeholders to further develop collaborations, not only through Aerospace Valley but also through larger collaboration structures, including this kind of congress.

Thursday, January 26th – 8:30

Formal Analysis for Embedded Real Time Systems

John Rushby – Program Director for Formal Methods and Dependable Systems, Computer Science Laboratory, SRI International, USA
Timed systems are notoriously hard to debug and verify because the continuous nature of time allows vast numbers of different behaviors; embedded systems must often deal with faults, and these introduce another dimension of complexity. Simulation and testing provide little assurance in these domains because they can visit only a small fraction of the possible behaviors. Formal methods of analysis have some promise, but until recently they could deal only with one dimension at a time: classical model checking could cope with faults but could not model continuous time; timed model checkers could deal with continuous time but not the "case explosion" due to faults.

Recently, a new class of "infinite bounded" model checkers has been developed, and Dutertre and Sorea have shown that these can cope simultaneously with both continuous time and discrete faults.

I will outline these developments in a manner that focuses on their practical utility to developers and certifiers.

Friday, January 27th – 8:30

Embedded Systems Research in Europe: current status and future prospects

Kostas Glinos – Head of Embedded Systems unit, DG Information Society and Media, European Commission, Belgium

The talk will provide an overview of the field in terms of its content, economic importance and growth potential. It will provide information on public funding in Europe, in particular through the EU's Framework Programme, and will outline plans for the period beyond 2007. It will also describe the possible role of future public-private partnerships such as the ARTEMIS technology platform.

PROGRAMME – Wednesday, January 25th

8:30	Participants register	
9:15	Opening Session Martin Malvy – Président du Conseil Régional Midi-Pyrénées (to be confirmed) G�rard Ladier – Airbus and Congress Co-Chairman Jean-Luc Mat� – Siemens VDO and Congress Co-Chairman Jean-Claude Laprie – LAAS-CNRS and Programme Committee Chairman	
9:45	Keynote address <i>Welcome of the attendees on behalf of Aerospace Valley</i> Jean-Marc Thomas – Senior Vice President, General Manager, Airbus France & Co-Project Leader, Aerospace Valley Session Chair: Jean-Claude Laprie – LAAS-CNRS, France	
10:45	Exhibition visit / Refreshment break	
	Session 1A: Validation Session Chair: Rafael Rodriguez – GTD, Spain	Session 1B: AADL Session Chair: Paul Arberet – CNES, France
11:15	<i>Some future challenges in the validation of control systems</i> Eric Goubault , Matthieu Martel, Sylvie Putot – CEA/Saclay, France	<i>The SAE architecture analysis & design language, an emerging standard for engineering performance critical systems.</i> Bruce Lewis – AADL Standardization Committee and US Army Aviation and Missile Command, USA
11:40	<i>Virtual prototyping for validation of functional architectures</i> Axel Kaske , Guillaume Fran�ois, Markus Maier – ETAS SAS, France	<i>Toward model-based engineering for space embedded systems and software</i> Jean-Paul Blanquart , Alain Rossignol – EADS Astrium, France Dave Thomas – LESIA, France
12:05	<i>Eliminating embedded software defects in a virtual system simulator</i> Ted Bennett , Paul Wennberg – Triakis Corporation, USA	<i>Behavioural descriptions in architecture description languages: Application to AADL</i> Mamoun Filali , Jean-Paul Bodeveix, Fran�ois Vernanda – F�RIA, France Pierre Dissaux – TNI-Europe, France Pierre Gauffillet – Airbus, France
12:30	Exhibition visit / Lunch	
14:00	Panel Session: From the A380 flying Modular avionics IMA to AUTomotive Open System ARchitecture AUTOSAR partnership <i>A unique European Round Table with executive engineering leaders from OEM and Supplier</i> Moderators: G�rard Ladier – Airbus, France Jean-Luc Mat� – Siemens VDO, France Panelists: J�rgen Bortolazzi – Head of Comfort Electronics Department, DaimlerChrysler, Germany Dario Louarduzzi – Avionics Product Manager, Airbus, France Jean Leflour – General Manager, Electronic and Electrical Architecture and Systems, PSA Peugeot Citro�n, France Marc Fumey – A380-IMA Design Authority, Thal�s Avionics, France	
	Session 2A: Formal Static Analysis Session Chair: Christel Seguin – ONERA, France	Session 2B: UML in Practice Session Chair: Luc Bourgeois – Renault, France
15:30	<i>Formal verification by abstract interpretation</i> Patrick Cousot – Ecole Normale Sup�rieure, France Radhia Cousot – Ecole Polytechnique, France	<i>AUTOSAR and SysML – a natural fit</i> Andreas Korff – ARTISAN Software Tools, Germany
15:55	<i>Formal verification workbench for airbus avionics software</i> St�phane Duprat – Atos Origin Jean Souyris, Denis Favre-Felix – Airbus, France	<i>Modelling distributed integrated modular systems using the UMLTM and the SysMLTM</i> Matthew Hause , Francis Thom – ARTISAN Software Tools, UK
16:20	<i>Incremental validation of real-time systems</i> David Dooze , Zoubir Mammeri – IIRIT, France	<i>EDROOM: a free tool for the UML2 component based design and automatic code generation of tiny embedded real time system.</i> Aitor Viana S�nchez , Oscar Rodr�guez Polo, Oscar Lopez, Mart�n Knoblauch Revuelta, Sebastian Sanchez Prieto, Daniel Meziat Luna – University of Alcal�, Spain
16:45	Exhibition visit / Refreshment break	
	Session 3A: Formal Development Session Chair: Gilles Motet – INSA, France	Session 3B: UML and Verification Session Chair: Gilles Le Calvez – Valeo, France
17:15	<i>B-RAIL: Risk analysis and specification</i> Jean-Louis Boulanger – UTC, France	<i>Formal and efficient verification techniques for Real-Time UML models</i> Pierre de Saqui-Sannes , Tarek Sadani – ENSICA and LAAS-CNRS, France Jean-Pierre Courtiat – LAAS-CNRS, France
17:40	<i>Vital software: Formal method and coded processor</i> Daniel Doll� – Siemens Transportation Systems, France	<i>UML inconsistencies assessment</i> Roberto Lopez Toro , Gilles Motet, Jean-Pierre Seuma Vidal, Hugues Malgouyres – LESIA / INSA, France
18:05	<i>Formal verification of manual code: some industrial needs and recommendations</i> Emmanuel Ledinot , Dillon Pariente – Dassault Aviation, France	<i>Bridging UML and safety-critical software development environments</i> Bernard Dion , Alain Le Guennec – Esterel Technologies, France
18:30	Cocktail party at the exhibition	

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PROGRAMME – Thursday, January 26th

8:30

Keynote address

Formal Analysis for Embedded Real Time Systems
John Rushby – Program Director for Formal Methods and Dependable Systems,
 Computer Science Laboratory, SRI International, USA
 Session Chair: **G rard Ladier** – Airbus, France

	<p>Session 4A: Model Checking Session Chair: Didier Juvin – CEA-LIST, France</p>	<p>Session 4B: WCET Assessment Session Chair: Eric Cazeaux – Siemens Transportation Systems, France</p>
9:30	<p><i>Experiences in using model checking to verify real time properties of a landing gear control system</i> Fr�d�ric Boniol, Virginie Wiels – ONERA/CERT, France Emmanuel LEDINOT – Dassault Aviation, France</p>	<p><i>Verifying timing properties of safety-critical embedded software by abstract interpretation</i> Christian Ferdinand, Reinhold Heckmann – AbsInt Angewandte Informatik, Germany</p>
9:55	<p><i>Formal verification techniques in a model-based development process based on targetlink generated C-code</i> Guido Sandmann, Udo Brockmeyer – OSC-Embedded Systems, Germany Michael Beine – dSPACE, Germany</p>	<p><i>OTAWA, a framework for experimenting WCET computations</i> Hugues Cass�, Pascal Sainrat – IIRIT, France</p>
	<p>Session 5A: Model Transformation Session Chair: Aldo Borri�ne – Fiat, Italy</p>	<p>Session 5B: Timeliness Assessment Session Chair: Antoni Ferre – Lear Automotive, Spain</p>
10:20	<p><i>Towards the verification of model transformations</i> Martin Strecker, Jean-Paul Bodeveix, Mamoun Filali, Nicolas Lalev�e – F�RIA, France David Chemouil – CNES, France</p>	<p><i>Experimentation of timed observers for validation of an avionics software</i> Hugues Bonnin, Eric Saves, Julien Honnore – CS-SI, France Philippe Dhaussy, Jean Charles Roger – ENSIETA, France</p>
10:45	<p><i>AutoMoDe – A transformation based approach for the model-based design of embedded automotive software</i> Ulrich Freund – ETAS, Germany Peter Braun – Validas, Germany Andreas Bauer, Jan Romberg – Technical University of Munich, Germany Dirk Ziegenbein – Robert Bosch, Germany</p>	<p><i>Real-time guarantees on full-duplex switched ethernet for military applications</i> Ahlem Mifdaoui, Fabrice Frances – ENSICA, France Christian Fraboul – ENSEEIHT/IRIT, France</p>
11:10	Exhibition visit / Refreshment break	
	<p>Session 6A: Model-Based Development Session Chair: Eric Bantegnie – Esterel Technologies, France</p>	<p>Session 6B: Real Time Networks Session Chair: Pierre Malaterre – PSA Peugeot Citro�en, France</p>
11:40	<p><i>Model driven engineering for embedded real-time systems</i> Yann Tanguy, S�bastien G�rard, Ansgar Radermacher, Fran�ois Terrier – CEA-List, France</p>	<p><i>Integration of quality of service in avionics architecture</i> G�rard Bel, Fr�d�ric Boniol, Pierre Bieber, Daniel Dalla Barba, Guy Durrieu, Boris Sidoruk – ONERA-Toulouse, France</p>
12:05	<p><i>Combining model-driven design with diverse formal verification</i> Peter Amey – Praxis HIS, UK Bernard Dion – Esterel Technologies, France</p>	<p><i>How OEMs and suppliers can tackle the network dimensioning problem</i> Kai Richter, Marek Jersak – SymTAVision, Germany Rolf Ernst – Institute of Computer and Communication Network Engineering, Germany</p>
12:30	<p><i>Model style guidelines for embedded code generation</i> Tom Erkkinen – The MathWorks, USA</p>	<p><i>Using network calculus to optimize the AFDX network</i> Fabrice Frances – ENSICA and T�SA, France Christian Fraboul – T�SA and ENSEEIHT/IRIT, France J�r�me Gri�u – ENSEEIHT/IRIT, France</p>
12:55	<p><i>A methodology for model based development of application software modules exemplified by radar based parking systems</i> Andy Yap – MB-technology, Germany Helmut Keller – DaimlerChrysler, Germany</p>	<p><i>Network for multimedia applications</i> Jean-Yves Berenger, Christian Bichet – NSI, France Francine Jeremie – Renault, France</p>
13:20	Exhibition visit / Lunch	
	<p>Session 7A: Development Process for Safety Session Chair: Jean-Paul Blanquart – EADS Astrium, France</p>	<p>Session 7B : Testing Session Chair: Stefan Voget – Siemens VDO Automotive, Germany</p>
14:50	<p><i>The TOPCASED project: a Toolkit in OPen source for Critical Aeronautic SystEm Design</i> Pierre Gauffillet, Patrick Farail – Airbus - France Agust� Canals, Christophe Le Camus – CS, France David Sciamma – Anyware Technologies, France Pierre Michel – F�RIA-ONERA, France Xavier Cregut, Marc Pantel – F�RIA-IRIT-ENSEEIH, France</p>	<p><i>Testability analysis for graphically described algorithms of reactive systems</i> Huy Vu Do, Chantal Robach – LCIS-ESISAR, France Michel Delaunay – LSR-IMAG, France Jean-S�bastien Cruz – Aerospatiale Matra Missiles, France</p>
15:15	<p><i>Development of safety critical applications in the automotive domain</i> Sylvain Sauvage – Trialog, France Amar Bouali – Esterel Technologies, France</p>	<p><i>Object Oriented Framework for Test Automation</i> Dietmar Peters – Siemens VDO Automotive, Germany</p>
15:40	<p><i>Computerized system validation: Regulatory compliance and process safety in the pharmaceutical industry</i> Yves Samson – Kereon, Switzerland</p>	<p><i>Automated functional test case generation from data flow specifications using structural coverage criteria</i> Christel Seguin, Guy Durrieu, Virginie Wiels – ONERA-Toulouse, France Bruno Marre, Benjamin Blanc – CEA-List, France Odile Laurent – Airbus, France Abdesselam Lakehal, Ioannis Parissis – LSR-IMAG, France</p>
16:05	<p><i>ISAAC, a framework for integrated safety analyses of functional, geometrical and human aspects</i> Ove Akerlund – Prover, Sweden P.Bieber, C. Castel, L. Sagaspe, C. Seguin – ONERA-Toulouse, France E. Boede, A. L�dke, T. Peikenkamp – OFIS M. Bolzano – IRST, Italy M. Bretschneider, M. Forte Da Cruz, M. Frisk, S. METGE, C. Papadopoulos, H. Trivedi – Airbus, France A. Cavallo – Alenia, Italy M. Cifaldi – SIA, Italy J. Gauthier – Dassault Aviation, France A. Griffault – Universit� de Bordeaux, France O. Lisagor – York University, UK P. Person – SAAB, Sweden</p>	<p><i>Testing embedded software using simulated hardware</i> Jakob Engblom, Bengt Werner – Virtutech, Sweden</p>

16:30		Exhibition visit / Refreshment break	
	<p>Session 8A: Process Improvement Session Chair: Jean-Loup Terrailon – ESA/ESTEC, The Netherlands</p>		<p>Session 8B: Human Machine Interaction Session Chair: Guy Boy – EURISCO, France</p>
17:00	<p><i>CMMI – An answer to the software crisis?</i> Bernard Guichoux, François DUBUC – EADS SPACE Transportation, France</p>		<p><i>A model-based approach towards human-machine-interfaces</i> Rainer Holve, Silke GORONZY – 3Soft, Germany</p>
17:25	<p><i>Shift towards a cohesive design based management of automotive embedded systems requirements</i> Lionel Burgaud, Eric Larronde, Eliane Fourgeau, TNI-Software, France</p>		<p><i>INSIDES a new virtual prototyping platform of human machine interactions systems for automotive and aerospace applications</i> Moh Sabeur, Dirk Schulz – Princess Interactive, Germany Michael Schabacker, Sandor Vajna – University Otto-von-Guericke, Germany</p>
17:50	<p><i>How train transportation design challenges can be addressed with simulation-based virtual prototyping for distributed systems</i> Franck Corbier, Laurent Kislin, Eliane Fourgeau, TNI-Software, France</p>		<p><i>Physical browsing – a novel HCI paradigm for people on the move</i> Heikki Ailisto, Lauri Pohjanheimo, Heikki Keränen, Petteri Alahuhta – VTT Electronics, Finland</p>
18:15	<p><i>The Myriade micro-satellite platform central flight software: a complex software developed according to an optimized, reduced successful development process</i> Catherine Laffaye, Philippe Larivière – CNES, France Pierre Digonnet – CS-SI, France</p>		<p><i>Fully exploiting the potential of speech dialog in automotive applications</i> Silke Goronzy, Ralf Kompe, Rainer Holve – 3Soft, Germany</p>
18:40 Exhibition visit			
19:30 Gala Dinner – Hôtel Dieu St Jacques			
The organisers reserve the right to make changes to the programme should they be deemed necessary			

PROGRAMME – Friday, January 27th

8:30	<p>Keynote address <i>Embedded Systems Research in Europe: current status and future prospects</i> Kostas Glinos – Head of Embedded Systems unit, DG Information Society and Media, European Commission, Belgium Session Chair: Jean-Luc Maté – Siemens VDO, France</p>		
	<p>Session 9A: Component-Based Approaches Session Chair: Michael Haneberg – BMW, Germany</p>		<p>Session 9B: Real Time Platforms Session Chair: Michel Fauveau – CNES, France</p>
9:30	<p><i>MERCEDES – Market Enabler for Retargetable COTS Components in Embedded Domain</i> Philippe Robin, Michel Sall – Trialog, France</p>		<p><i>The Ideal RTOS</i> Colin Walls – Mentor Graphics, UK</p>
9:55	<p><i>The convergence of embedded systems in aeronautics and in automotive industry via software components and standards</i> Philippe Jousain – Embedded Touch, France</p>		<p><i>Managing the complexity of emerging EE-Architectures</i> Thomas Scharnhorst, Bernd Kunkel, Gabriel Schwab – Volkswagen, Germany</p>
	<p>Session 10A: Business Models for Real Time Systems Session Chair: François Vernières – IERSET, France</p>		
10:20	<p><i>Software business models for AUTOSAR automotive world standard</i> Thomas Soulier – Siemens VDO Automotive, France</p>		<p><i>Avionics standards, software and IMA</i> Brigitte Bauer – Thales Avionics, France</p>
10:45	<p><i>Eurostar 3000 satellite on-board software - Development of a product line towards multiple system needs</i> Alain Rossignol, Didier Breton – EADS Astrium, France</p>		<p><i>Modeling and generating tailored distribution middleware for embedded real-time systems</i> Thomas Vergnaud, Khaled Barbaria, Irfan Hamid, Laurent Pautet, Sylvie Vignes, Elie Najm – ENSI-INFRES, France</p>
11:10 Exhibition visit / Refreshment break			
	<p>Session 11A: Business Model – Open Source Session Chair: Werner Froehling – Volvo Technology, Sweden</p>		<p>Session 11B: Certification Session Chair: Louis-Claude Vignaud – Siemens VDO Automotive, France</p>
11:40	<p><i>Open source software: risk or opportunity?</i> Sylvain Wallez – Anyware Technologies, France</p>		<p><i>Identification model of the object-oriented technology's risks, for an avionics' certification</i> Stéphanie Gaudan, Eric Jenn, Stéphane Leriche – Thales Avionics, France Gilles Motet – INSA, France</p>
12:05	<p><i>FLOSS, COTS, and Safety: A business perspective</i> Franco Gasperoni – AdaCore, France</p>		<p><i>Certification & object orientation: The new Ada answer</i> Cyrille Comar – AdaCore, France</p>
12:30	<p><i>TS2P an open source Test-bed & Simulation Software Platform</i> Eric Noulard – BT Consulting & Systems Integration, France Yves Dufrenne – EADS Astrium, France</p>		<p><i>Legal aspects of safety designed software development, especially under European law</i> Wolf Günther – KANZLEI DR. ERBEN, Germany</p>
12:55	<p>Closing Session: Gérard Ladier – Airbus and Congress Co-Chairman Jean-Luc Maté – Siemens VDO and Congress Co-Chairman Jean-Claude Laprie – LAAS-CNRS and Programme Committee Chairman</p>		
13:30 Exhibition visit / Lunch			
15:00 Technical Visits (Optional) Airbus or Siemens VDO Automotive			
The organisers reserve the right to make changes to the programme should they be deemed necessary			

GENERAL INFORMATION

ERTS 2006 EXHIBITION

A major exhibition will be run in parallel to ERTS 2006, covering a wide range of products and services in the field of transport embedded software.

This unique European event will bring together more than 600 participants: directors, managers, department leaders, engineers, researchers and technicians. Representatives from universities and research centres, as well as journalists, will also participate. An exceptional line-up of guests and speakers will be present for the occasion.

The Exhibition will allow you to inform the participants, to present your news and create privileged contacts within this unique gathering of target decision-makers.

The Exhibition and conference areas are situated under the same roof allowing attendees to visit booths during the symposium. All refreshments and the conference welcome cocktail will be served in the exhibition hall.

In addition, each exhibition company will have the opportunity of inviting up to 50 guests and prospective clients to visit its booth and exchange network contacts.

Booths may be reserved for immediate entry. This offer is limited and it is highly recommended that you book your booth space as early as possible.

6 m² Booth + Conference registration for 1 people: 2200 € VAT included.

9 m² Booth + Conference registration for 2 people: 3200 € VAT included.

Exhibitor list

(updated 06/10/2005)

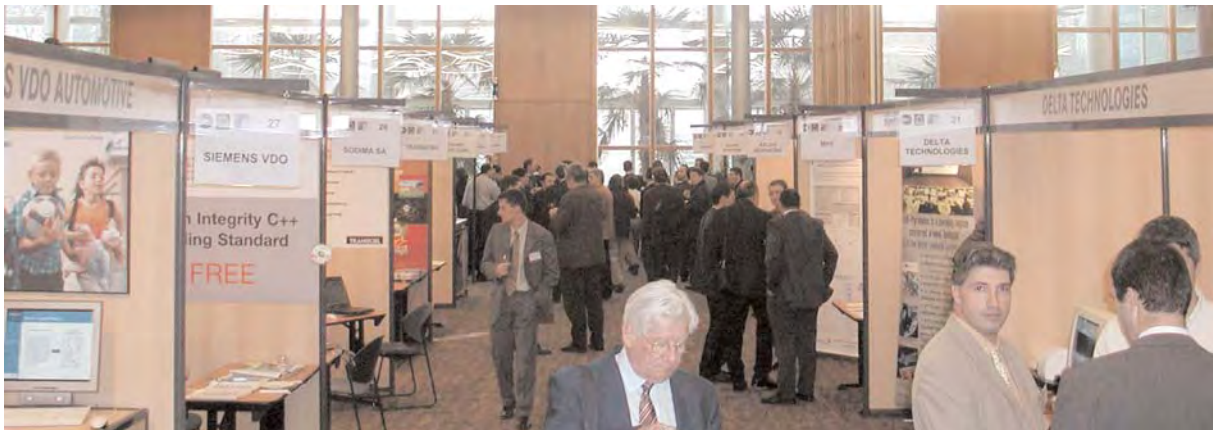
- Absint
- Adacore
- dSpace
- Embelec
- Etas
- MS Princess Interactive
- Nijkerk
- NSI
- Siemens VDO Automotive
- Sodima
- Sogeti-Transiciel
- Sysgo
- TNI Software
- Vector

For information on the ERTS 2006 exhibition, please visit www.erts2006.org

or contact Joëlle Stella:

AAAF - 23, avenue Edouard Belin - F-31400 TOULOUSE - FRANCE

Tel.: +33 (0)5 62 17 52 80 - Fax: +33 (0)5 62 17 52 81 - Email: aaafflse@aol.com



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For further information, please visit the website www.erts2006.org

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Tel.: +33 (0)1 56 90 37 03 - Fax: +33 (0)1 56 90 37 08 - Email: congres@see.asso.fr



GENERAL INFORMATION



GALA DINNER (Included in registration fees)

On Thursday, January 26th, the gala dinner will be held at "Hotel Dieu Saint-Jacques", which was founded on the left bank of the Garonne as a hospital in the 12th century and is included on UNESCO's world heritage list.

A shuttle service will be arranged from the Pierre Baudis Conference Center to the Hotel Dieu St Jacques - Shuttle Departure at 7.30 pm

TECHNICAL VISITS (Optional)

On Wednesday, January 27th 2 exclusive technical visits will be organised:

- Airbus A380 assembly line (limited to 30 persons).
- Siemens VDO Automotive Test Center and Manufacturing Plant (limited to 30 persons).

Price: 20 € incl. VAT

A shuttle service will be arranged from the Pierre Baudis Conference Center to Siemens and Airbus - Shuttle Departure at 2.30 pm



A380 Assembly line



Siemens VDO Automotive Toulouse Location

GENERAL INFORMATION

HOTEL ACCOMMODATION

We have selected a list of the most convenient hotels situated in the City Centre.

Delegates are encouraged to make their own hotel reservations early, directly with the hotels of their choice

WILSON SQUARE** 53 € to 70 €
12 Rue d'Austerlitz – 31000 Toulouse
Tel: +33 (0)5 61 21 67 57 – Fax: +33 (0)5 61 21 16 23
www.hotel-wilson.com - contact@hotel-wilson.com

IBIS CENTRE** 52 € to 71 €
2, Rue Claire Pauilhac – 31000 Toulouse
Tel: +33 (0)5 61 63 6163 – Fax: +33 (0)5 61 63 07 46
www.ibishotel.com

BRIENNE*** 73 € to 87 €
20 Boulevard Maréchal Leclerc – 31000 Toulouse
Tel: +33 (0)5 61 23 60 60 – Fax: +33 (0)5 61 23 18 94
www.hoteldebrienne.com - hoteldebrienne@wanadoo.fr

MERMOZ -PHOENICIA*** 101 € to 125 €
50, Rue Matabiau – 31000 Toulouse
Tel: +33 (0)5 61 63 04 04 – Fax: +33 (0)5 61 63 15 64
www.hotel-mermoz.com - information@hotel-mermoz.com

SOFITEL**** 110 € to 340 €
84, allées Jean Jaurès - 31000 TOULOUSE
Tel: +33 (0)5 61 10 23 10 – Fax: +33 (0)5 61 10 23 20
www.sofitel.com - H1091@accor-hotels.com

VICTOR HUGO** 51 € to 62 €
26, Bd de Strasbourg – 31000 Toulouse
Tel: +33 (0)5 61 63 40 41 – Fax: +33 (0)5 61 62 66 31
www.hebergementsdefrance.com/hotel-victorhugo
hotel-victor-hugo@wanadoo.fr

IBIS MATABIAU ** 52 € to 69 €
14 Boulevard Bonrepos – 31000 Toulouse
Tel: +33 (0)5 61 62 50 90 – Fax: +33 (0)5 61 99 21 02
www.ibishotel.com

MERCURE ATRIA*** 115 € to 125 €
8, esplanade Compans-Caffarelli – 31901 Toulouse cedex
Tel.: +33 (0)5 61 11 09 37 – Fax: +33 (0)5 61 11 09 28
www.mercure.com - H1585@accor-hotels.com

HOLIDAY INN* (CAPOUL)** 110 € to 124 €
13, Place Wilson - 31000 Toulouse
Tel: +33 (0)5 61 10 70 70 – Fax: +33 (0)5 61 21 96 70
www.capoul.com - hi@capoul.com

PALLADIA**** 190 € to 490 €
271, Avenue de Grande Bretagne – 31300 Toulouse
Tel: +33 (0)5 62 120 152 – Fax: +33 (0)5 62 120 121
www.hotelpalladia.com - info@hotelpalladia.com



VENUE

ERTS 2006 will be held at the **Pierre Baudis Convention Center** in Toulouse. The Pierre Baudis Convention Center is located in the centre of Toulouse's cultural and commercial activity on the edge of the Compans-Caffarelli Park (7 hectares).

11, esplanade Compans Caffarelli – 31000 TOULOUSE – France
Tel: +33 (0)5 62 30 40 40 – Fax: +33 (0)5 62 30 41 41
www.centre-congres-toulouse.fr

Toulouse: a subtle blend of humanity, history and modernity

From the Garonne to the Canal du Midi, and from Saint Sernin to the Cité de l'Espace, the many different faces of Toulouse invite visitors to come on a journey of discovery.

Besides a rugby playing temperament, the grace of the Canal du Midi and local cuisine - confit, foie gras and cassoulet served with excellent local wines such as Gaillac and Fronton, Toulouse offers its guests a rich heritage from medieval and renaissance times.

For further information on Toulouse and Midi Pyrénées Region: www.ot-toulouse.com

GENERAL INFORMATION

ACCESS

By plane: There are direct connections by air between the major European cities and Toulouse. Alternatively Air France offers connection in Paris through its hub in Charles de Gaulle airport, or a shuttle service from Orly airport. From Toulouse-Blagnac airport to the city centre, there is a shuttle bus operating every 20 minutes. The shuttle service stops just in front of the Centre de Congrès Pierre Baudis at the stop known as: Compans Caffarelli, or a taxi ride will take about 10 minutes.

By train : You can try-out the high speed train (TGV) from Paris Montparnasse station, but the journey will take more than 5 hours since the special tracks are available only for part of the trip.

Transport

A special agreement with AIR FRANCE and the French Railways has been settled by the ERTS 2006 organizers. French Railways

Please contact SEE office (congres@see.asso.fr) in order to get a SNCF (French Railways) voucher.

Upon presentation of this voucher at a station, you will be issued with a return ticket subject to the conditions of Congress fare. This fare is available on all SNCF lines and gives the benefit of a 20% reduction in 1st or 2nd class.

Air France

You can benefit from a reduction of up to 45% subject to availability for a two-way ticket on the AIR FRANCE metropolitan network as well as preferential tariffs, also subject to availability, on their international network when travelling to ERTS 2006.



AGREMENT AIR FRANCE :
AXZE SE 5881
 Valid from 19 January to
 1 February 2006





REGISTRATION FORM

ERTS 2006

25-27 January 2006 – Toulouse, France

Please complete and return this form to:

SEE, 17, rue de l'Amiral Hamelin – 75783 PARIS CEDEX 16 - FRANCE

Tel.: +33 (0)1 56 90 37 06 – Fax: +33 (0)1 56 90 37 08 – email : congres@see.asso.fr

Alternatively, we strongly recommend you to register directly on-line via the Conference Website: www.erts2006.org

Please use BLOCK CAPITALS when filling in this form

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Position: _____

Address: _____

Postcode: _____ City: _____ Country: _____

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Registration fees (Tick as appropriate)

	EARLY Registration On or before 10 December 2005	LATE Registration After 10 December 2005
Members of SIA, AAAF or SEE	<input type="checkbox"/> 660 € incl. VAT (551.84 € excl. VAT)	<input type="checkbox"/> 720 € incl. VAT (602.00 € excl. VAT)
Non Members	<input type="checkbox"/> 720 € incl. VAT (602.00 € excl. VAT)	<input type="checkbox"/> 790 € incl. VAT (660.53 € excl. VAT)
Speakers, Session Chairmen and Non-Profit-Making Organisations	<input type="checkbox"/> 480 € incl. VAT (401.34 € excl. VAT)	<input type="checkbox"/> 530 € incl. VAT (443.14 € excl. VAT)
Retired / Students	<input type="checkbox"/> 180 € incl. VAT (150.50 € excl. VAT)	<input type="checkbox"/> 180 € incl. VAT (150.50 € excl. VAT)
Technical Visits (Optional)	<input type="checkbox"/> 20 € incl. VAT (16.72 € excl. VAT)	
Choose your visit	<input type="checkbox"/> Airbus <input type="checkbox"/> Siemens VDO Automotive	ID or passport number: _____ ID date and place of delivery: _____ Nationality country and birth date: _____
Additional CD Rom Proceedings	<input type="checkbox"/> 95 € incl. VAT (79,43 € excl. VAT)	
Additional gala dinner	<input type="checkbox"/> 80 € incl. VAT (66,89 € excl. VAT)	

(According to availability at the time of purchase)

Preferential rates: a discount is allowed for more than 4 registrations.

For further information, contact us

► Payment

By cheque in Euros made payable to: "SEE / ERTS"

By bank transfer in Euros made payable to: "SEE / ERTS" (please attach a copy)

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REGISTRATION CONDITIONS

- Registration fees include participation in the conference, CD of proceedings, Book of abstracts, coffee breaks, lunches, cocktail, and gala dinner.
- Where it is not possible to send the payment together with the form, each registration should be accompanied by an official purchase order. Failing reception of an official purchase order or payment on the day of the symposium, we regret that you will not be allowed entry to the symposium.
- When we have received the registration form, we will send you a confirmation letter and an invoice. Please indicate the accounts department address where necessary.
- In case of cancellation before January 7, 2006, 30% of the registration fees will be retained by the organisers. After this date, the entire registration fee will be retained. Registered participants not able to attend may nominate a substitute. Written notice must be provided.

Driven by automotive passion



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