# NOTERE'2010, 10<sup>th</sup> International Annual Conference on New Technologies of Distributed Systems

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# SUMMARY of NOTERE PROGRAM

| Time | May 31 (Monday) | June 1st (Tuesday) | June 2nd (Wednesday) |
|---|---|---|---|
| 08:15 - 08:30 | Registration | | |
| 08:30 - 08:45 | | (S5) Service Discovery and Composition | (S9) MDA for distributed systems |
| 08:45 - 09:00 | Opening | | |
| 09:00 - 09:15 | | | |
| 09:15 - 10:15 | Research Track Keynote | | |
| 10:15 - 10:45 | Coffee Break | Coffee Break | Coffee Break |
| 10:45 - 11:00 | (S1) Formal Description | Research Track Keynote | Research Track Keynote |
| 11:30 - 11:45 | | | |
| 11:45 - 12:00 | | (S6) MANET Management | (S10) WSN and applications |
| 12:00 - 13:00 | (S2) Availability and load balancing in P2P and distributed systems | | |
| 13:00 - 13:30 | Lunch | Lunch | Closing Session |
| 13:30 - 15:00 | | | Lunch |
| 15:00 - 16:15 | (S3) SOA & Ambient intelligence | (S7) Ubiquitous and Collaborative Systems | |
| 16:15 - 16:45 | Coffee Break | Coffee Break | |
| 16:45 - 18:00 | (S4) Parallel and Distributed Algorithms | (S8) MANET Management and QoS | |
| 20:00 | | Banquet | |

# PROGRAM of NOTERE

**Monday, May 31**

**08:15 - 08:45**   **Registration**

**08:45 - 09:15**   **Opening**

**09:15 - 10:15**   **Research Track Keynote**

**Session Chair:** Ken Turner, University of Stirling, United Kingdom

Sandeep K. Shukla

Model Driven Embedded Software Generation: A Generative Approach to Safety

**10:15 - 10:45**   **Coffee Break**

**10:45 - 12:00**   **Session 1: Formal Description**

**Session Chair:** Michel Raynal, IRISA, Campus de Beaulieu Rennes1- Univ. France

Daniel Knorreck, Ludovic Apvrille and Renaud Pacalet
Formal System-level Design Space Exploration

Thomas Chatain and Claude Jard
Sémantique concurrente symbolique des réseaux de Petri saufs et dépliages finis des réseaux temporels

Gilles Lasnier, Thomas Robert, Laurent Pautet and Fabrice Kordon

Behavioral Modular Description of Fault Tolerant Distributed Systems with AADL Behavioral Annex

**12:00 - 13:00**    **Session 2: Availability and load balancing in P2P and distributed systems**

**Session Chair:** Mohamed Jemni, ESST - Tunis, Tunisia

Radwane Saad, Ahmed Serrhouchni and Ken Chen
hTracker: towards a Service Provider Oriented Peer-to-Peer architecture

Ali Kanso, Ferhat Khendek, Abdelwahab Hamou-Lhadj, and Maria Toeroe

Ranking Service Units for Providing and Protecting Highly Available Services with Load Balancing

**13:00 - 15:00**    **Lunch**

**15:00 - 16:15**    **Session 3: SOA  &  Ambient intelligence**

**Session Chair:** Samir Tata, TELECOM SudParis -Evry, France

Kenneth Turner
Device Services for The Home

Yasmine Charif, Kostas Stathis and Hafedh Mili
Towards    Anticipatory Service Composition  in   Ambient

Intelligence

MariaGrazia Fugini, Claudia Raibulet and Luigi Ubezio
Risk Characterization and Prototyping

|  |  | **Poster Session** |
|---|---|---|
| **16:15 - 16:45** | **Coffee Break** | Adel Alti and Abdellah Boukerram<br>QualiStyle: A Tool for Automatic Quality Evaluation and Selection of Architectural Styles |

**16:45 - 18:00**    **Session 4: Parallel and Distributed Algorithms**

**Session Chair:** Soumaya Cherkaoui, Sherbrook University, Canada

Samia Kouki, Mohamed Jemni and Talel Ladhari
Design of Parallel Distributed Algorithm for the Permutation Flow Shop Problem

Olivier Flauzac, Bachar Salim Haggar and Florent Nolot
Tree and Cluster Management for MANET

Nadège Pontisso, Philippe Quéinnec and Gérard Padiou
Analysis of Distributed Multi-Periodic Systems to Achieve Consistent Data Matching

**Tuesday, June 1st**

**08:30 - 10:15**     **Session 5: Service Discovery and Composition**

**Session Chair:** Ferhat Khendek, Concordia University - Montreal, Canada

Mohamed Sellami, Olfa Bouchaala, Walid Gaaloul and Samir Tata

WSRD:  A Web Services Registry Description

Abdelghani Benharref, Mohamed Adel Serhani, Salah Bouktif and Jamal Bentahar

A Managerial Community of Web Services for Management of Communities of Web Services

Mohammed Erradi and Soumaya Cherkaoui

Expérimentation d'un Algorithme de Gestion de QoS lors de la Découverte de Service

Emna Fki, Said Tazi and Chantal Soulé-Dupuy

Towards a User Intention  Aware Service Composition

**Poster Session**

**10:15 - 10:45**     **Coffee Break**     Fatma Krichen, Brahim Hamid, Bechir Zalila and Bernard Coulette

Designing Dynamic Reconfiguration for Distributed Real Time Embedded Systems

**10:45 - 11:45**     **Research Track Keynote**

**Session Chair:** Claude Jard, National High School of Cachan, France

Michel Raynal

Communication and agreement abstractions for fault-tolerant distributed systems

**11:45 - 13:00**     **Session 6: MANET Management**

**Session Chair:** Mohamed Mosbah, ENSERB - Bordeaux, France

Dennis Christmann, Reinhard Gotzhein, Marc Krämer and Martin Winkler

Flexible and Energy-efficient Duty Cycling in Wireless Networks with MacZ

Sofiene Jelassi, Habib Youssef and Guy Pujolle

Réglage optimal du buffer de lecture pour un streaming sans rupture à travers un réseau mobile

Mohamad El Masri, Slim Abdellatif and Guy Juanole

On Resource Management in Heterogeneous Wireless Access Networks application to automated highway systems

**13:00 - 15:00**     **Lunch**

**15:00 - 16:15** **Session 7: Ubiquitous and Collaborative Systems**

**Session Chair:** Faiez Gargouri, ISIM - Sfax, Tunisia

German Sancho, Ismael Bouassida Rodriguez, Thierry Villemur and Said Tazi

What About Collaboration in Ubiquitous Environments?

Yassine El Ghayam and Mohamed Erradi

Decision Tree Based Context Management in a Collaborative Environment

Mikael Desertot, Sylvain Lecomte, Dana Popovici, Marie Thilliez and Thierry Delot

A context aware framework for services management in the Transportation Domain

**Poster Session**

**16:15 - 16:45** **Coffee Break** Yousra Bendaly Hlaoui and Leila Jemni Benayed

Symbolic Model Checking Supporting
Formal Verification of Grid Service Workflow
Models Specified by UML Activity Diagrams

**16:45 - 18:00**      **Session 8: MANET Management and QoS**

**Session Chair:** Habib Youssef, ISITC – Hammem Sousse, Tunisia

Mohamed Aymen Chalouf and Francine Krief

Une négociation dynamique de niveau de service de bout en bout sécurisée

Husna Osman and Hamish Taylor

Managing Group Membership in Ad Hoc M-Commerce Trading Systems

Abdelmajid Hajami, Kamal Oudidi and Mohammed Elkoutbi

An enhanced algorithm for MANET clustering based on Multi hops and Network Density

**20:00**      **Banquet**

**Wednesday, June 2nd**

**08:30 - 10:15**      **Session 9: MDA for Distributed Systems**

**Session Chair:** Ludovic Apvrille, TELECOM ParisTech - Paris, France

Lilia Sfaxi, Takoua Abdellatif, Yassine Lakhnech and Riadh Robbana

Contrôle du flux d'information des systèmes distribués à base de composants

Adel Alti, Abdellah Bookerram, Makhlouf Derdour and Phillipe Roose

Context-aware Quality Model Driven Approach

Mounira Bouzahzah and Ramdane Maamri

A Model for Criticality Evaluation Based on Hierarchical Plans to Provide Fault Tolerance in Multi Agent Systems

Pierre Schmitt, Cédric Bonhomme and Benjamin Gâteau

Easy programming of Agent based Electronic Institution with UTOPIA

**10:15 - 10:45**   **Coffee Break**

**10:45 - 11:45**   **Research Track Keynote**

**Session Chair:** Reinhard Gotzhein, Univ. of Kaiserslautern, Germany

Nicolas Guelfi

Dependability and Resilience from a Software Engineering Perspective

**11:45 - 13:00**   **Session 10: WSN and applications**

**Session Chair:** Thierry Villemur, LAAS-CNRS - Toulouse Univ., France

Nesrine Ouled Abdallah, Hatem Hadj Kacem, Mohamed Mosbah and Akka Zemmari

Broadcast in wireless mobile sensor networks with population

protocols and extension with the rendezvous model

Laura Margarita Rodríguez Peralta, Bruno Alexandre Teixeira Gouveia, Dália José Gomes de Sousa and Cláudio da Silva Alves

Enabling Museum's Environmental Monitorization based on low-cost WSNs

Nawel Bendimerad, Bouabdellah Kechar and Hafid Haffaf

Node disjoint Multipath routing based on DYMO Protocol with QoS Guaranty in Wireless Sensor Networks

**13:00 - 13:30**    **Closing Session**

**13:30 - 15:00**    **Lunch**

# KEYNOTES SPEAKERS

**Model Driven Embedded Software Generation: A Generative Approach to Safety**

**Sandeep K. Shukla**
Associate Professor of Computer Engineering
Deputy Director of Center for Embedded Systems for Critical Applications
Director of FERMAT Lab
Virginia Polytechnic and State University, USA

**Biography:** Sandeep K. Shukla is an associate professor of computer engineering at Virginia Tech. He is also a founder and deputy director of the center for embedded systems for critical applications (CESCA), and director of his research lab FERMAT. Sandeep was awarded the Presidential Early Career Award for Science at Engineering (PECASE) award for his research in design automation for embedded systems design, which in particular focuses on system level design languages, formal methods, formal specification languages, probabilistic modeling and model checking, dynamic power management, application of stochastic models and model analysis tools for defect-tolerant system design, and reliability measurement of defect-tolerant systems. Sandeep has published more than 125 articles in journals, books and conference proceedings. Sandeep co-authored three research monographs, and four edited volumes. Sandeep has been elected as a College of Engineering Faculty Fellow at Virginia Tech. In 2008 Sandeep was awarded the

Alexander Humboldt Foundation's Bessel Award. Sandeep also chaired a number of international conferences and workshops, edited a number of special issues for various journals, and are on the editorial board of IEEE Design & Test, IEEE Transactions on Computer, and IEEE Embedded Systems Letters. Sandeep is a senior member of IEEE and ACM.

He is also an IEEE Computer Society Distinguished visitor, and an ACM distinguished speaker.

**Abstract:** Avionics, automotive, power plant control, and many other safety-critical embedded systems require safe, predictable, and statically analyzable software. Moreover, as the complexity of these applications mounts, performance and safety both become increasingly important. This increasing performance requirement drives the current market trend of multi-core processors (single chip multiprocessors) in the desktop market. However, recently embedded processors have started to surface with multiple homogeneous or heterogeneous cores. Multi-threaded or concurrent applications seem to be the best way to exploit these available parallel processing resources.

Those with any experience with multi-threaded programming would admit that design and implementation of multi-threaded programs is extremely difficult and prone to subtle concurrency and synchronization bugs, even without the use of advanced techniques such as speculative hreading, or wait-free synchronization etc are. The inherent synchronization and dependency issues and the possible non-determinism are difficult to resolve without extremely skilled programmers, and possibly with the help of extensive static analysis. Static analysis and/or formal verification of large concurrent applications are again capacity limited by today's state-of-the-art tools and techniques. Nevertheless, given the importance of safety in the target application domains, one has to produce absolutely correct code which is deterministic or

predictable, and no non-deterministic execution behavior should lead to disastrous consequences.

Correct-by-construction multi-threaded program generation is therefore our methodology of choice. For this, we need a formal specification language with well defined semantics and proper characterizations as to when it is safe to generate guaranteed deterministic code. We have chosen Polychronous or multi-rate specification language borrowing from the French synchronous programming languages. Synchronous languages have so far proven useful for generating sequential (single-threaded) code for safety-critical applications. A particular characterization of polychronous specifications called the 'endochrony' is a sufficient condition for correct sequential code generation. Therefore, one could generate multiple sequential threads separately from 'endochronous' specification fragments, and compose them by generating the synchronization glue code. Unfortunately, 'endochrony' is not compositional, and therefore, the synchronization code generation becomes non-trivial. We show that a particular generalization of 'endochrony' called the 'weak endochrony' is sufficient for directly generating multi-threaded code from such specifications. Moreover, 'weak endochrony' is compositional and hence provides us with a modular code generation technique from polychronous specification.

In this talk, first, we elaborate on multi-rate specification formalism Polychrony. Then we explain the difficulties of deterministic and semantics preserving code generation from such specifications. Then we discuss endochrony, inadequacy of which leads to the weak endochrony concept, and how this provides a sufficient condition for safe multi-threaded code generation. Finally, we discuss future directions in our work on deterministic multi-threaded code generation for safety-critical applications.

# Communication and agreement abstractions for fault-tolerant distributed systems

**Michel Raynal**

Professor of Computer Science
IRISA, Campus de Beaulieu Université de Rennes1
France

**Biography:** Michel Raynal is a professor of computer science at the University of Rennes, France. His main research interests are the basic principles of distributed computing systems. Michel Raynal is the author of numerous papers on distributed algorithms and a world leading researcher in the domain of distributed computing. He has chaired the program committee of the major conferences on the topic, such as the IEEE Int'l Conference on Distributed Computing Systems (ICDCS), the Symposium on Distributed Computing (DISC), the Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO), and the Int'l Conference on Principles of Distributed Systems (OPODIS). He has also served on the program committees of many international conferences, and is the recipient of several "Best Paper" awards. Michel Raynal has been invited by many universities all over the world to give lectures on distributed computing.

**Abstract:** Understanding distributed computing is not an easy task. This is due to the many facets of uncertainty one has to cope with and master in order to produce correct distributed software. Considering the uncertainty created by asynchrony and process crash failures in the context of message-passing systems, the talk will focus on the main abstractions that one has to understand and master in order to be able to produce software  with guaranteed properties. These fundamental abstractions are communication abstractions that allow the processes to communicate consistently (namely the register abstraction and the reliable broadcast abstraction), and the consensus agreement abstractions that allows them to cooperate despite failures.  As they give a precise meaning to the words "communicate" and "agree" despite asynchrony and failures, these abstractions allow distributed programs to be designed with properties that can be stated and proved.

Impossibility results are associated with these abstractions. Hence, in order to circumvent these impossibilities, the talk relies on the failure detector approach.

# Dependability and Resilience from a Software Engineering Perspective
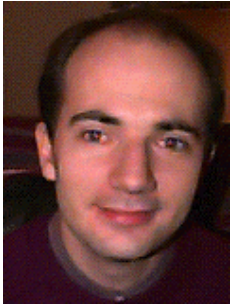
**Nicolas Guelfi**

Professor of Computer Science
Faculty of Sciences, Technology and Communication
Computer Science & Communications Research Unit
LASSY - Laboratory for Advanced Software Systems
University of Luxembourg

**Biography:** Nicolas Guelfi is professor at the Faculty of Sciences, Technologies and Communications of the University of Luxembourg since March 1999, where he teaches, directs PhD students and makes research in collaboration with national and international partners. Currently, he is the head of the Laboratory for Advanced Software Systems. His main research and development activities concern the engineering and the evolution of reliable and secure distributed and mobile systems based on semi-formal methods and transformations. He is the author of around 50 publications in books, journals, conferences and workshops. He has been for three years the Luxembourgian ERCIM representative at the executive committee of the ERCIM consortium and he is co-chairman of the ERCIM working groups on Software EngineeRing for rEsilieNt systems (SERENE - http://serene.uni.lu). SERENE considers resilient systems as open and distributed systems that can dynamically adapt in a predictable way to unexpected events. The research group of Nicolas

Guelfi is made of PhD students, engineers and post-doctoral members that are running national or international research projects with important cooperation with universities or industries.

**Abstract:** The first part of this talk aims at presenting a rigorous conceptual framework for defining the concepts of dependability and resilience. The terms dependability resilience, since the seventies, has been used in nearly all the computer information systems and computer science fields. The introduction and use of these concepts in all these fields makes difficult to have a shared and precise definition of the concept of resilience. Having such definition is nevertheless mandatory for the software and systems engineering research community that create development processes, languages and tools to support the engineering of software and systems that would be required to be dependable or resilient. For this, we introduce an abstract and generic terminology to be used when speaking about resiliency. We also provide some abstract semantic descriptions to these terminological elements. This formal framework is defined from a software engineering perspective, which means that we define its components such that they are useful for the development or improvement of analysis, architectural design, detailed design, implementation, verification and maintenance phases. The second part of the talk aims at presenting an approach for modeling dependable collaborative time-constrained business processes.

The effectiveness of the information system a particular organisation uses for running its business depends largely of the success in modelling such business. This is due to the fact the business model defines the requirements of the information system that will support the running of the business. Nowadays, there exist many business process development methods that are supported by modelling notations and tools. Unfortunately these methods are not capable to model jointly complex collaborations, time constraints and to offer means to support resilient business process engineering. We will present shortly a business process language called DT4BP, which has been designed to drive the modeling of dependable, collaborative and time-constrained business processes. The presentation of DT4BP is made targeting end users, which are business processes modellers.

# SUMMARY of WORKSHOPS PROGRAM

| Time | May 30 (Sunday) | |
|---|---|---|
| 08:00 - 08:30 | Registration | |
| 08:30 - 08:45 | Opening Session | |
| 08:45 - 10:15 | WS 1: DANCE - Session 1 | WS 2: Web2Touch - Session 1 |
| 10:15 - 10:45 | Coffee Break | |
| 10:45 - 12:15 | WS 1: DANCE - Session 2 | WS 2: Web2Touch - Session 2 |
| 12:30 - 14:30 | Lunch | |
| 14:30 - 16:15 | WS 1: DANCE - Round table | WS3: PROMASC - Session 1 Research Track Keynote |
| 16:15 - 16:45 | Coffee Break | |
| 16:45 - 19:00 | WS2: Web2Touch -  Round table | WS3: PROMASC - Session 2 |

# PROGRAM of the WORKSHOPS

**Sunday, May 30**

**08:00 - 08:30: Registration**

**08:30 - 08:45: Opening Session**

**08:45 - 10:15**

## WS 1: DANCE - Session 1

Mohamed-Lamine Boukhannoufa, Ansgar Radermacher and François Terrier

Towords a Model Driven Engineering approach for developing adaptive real-time embedded systems

Marisol García-Valls, Pablo Basanta-Val and Iria Estévez-Ayres

A component model for homogeneous implementation of reconfigurable service-based distributed real-time applications

Fatma Krichen

Position paper: Advances in Reconfigurable Distributed Real Time Embedded Systems

## WS 2: Web2Touch - Session 1

Nicolas Guelfi, Cédric Pruski and Chantal Reynaud

Experimental Assessment of the TARGET Adaptive Ontology-based Web Search Framework

Andrea Bosin, Nicoletta Dessì, Madusudhanan Bairappan and Barbara Pes

Will SOA accommodate the next step of e-Science?

Felipe Serpeloni, Regina Moraes and Rodrigo Bonacin

A Semi-Automated Approach to Validate Ontology Mappings

**10:15 - 10:45 : Coffee Break**

**10:45 - 12:15**

**WS 1: DANCE - Session 2**

Manel Fredj, Ansgar Radermacher, Sebastien Gerard and Francois Terrier

eC3M: Optimized Model-based Code Generation for Embedded Distributed Software Systems

Manzoor Ahmad

First Step Towards a Domain Specific Language for Self-Adaptive Systems

Damien Masson and Cerge Midonnet

The Design of a Real-Time Event Manager Component

**WS 2: Web2Touch - Session 2**

Mohamed Gharzouli and Mahmoud Boufaida

A Distributed P2P-Based Architecture for Semantic Web services Discovery and Composition

Júlio Cesar Dos Reis, Rodrigo Bonacin and Maria Cecilia Calani Baranauskas

Search Informed by a Semiotic Approach in Social Network Services

Maria Grazia Fugini, Claudia Raibulet and Luigi Ubezio

A Web-Service Architectural Perspective on Risk Management in Work Environment

**12:30 - 14:30 Lunch**

**14:30 - 16:15**

**WS 1: DANCE - Round table**

**WS3: PROMASC - Session 1
Research Track Keynote**

**Session Chair:** Riadh Ben Halima, ENI - Sfax, Tunisia

Samir Tata & Wajdi Louati

**Cloud services as Cloud of services**

**16:15 - 16:45 - Coffee Break**
**16:45 - 19:00**
**WS2: Web2Touch -  Round table**

**WS3: PROMASC - Session 2**
**Session Chair:** Mohamad El Masri, LAAS-CNRS - Toulouse Univ., France

Siani Pearson and Tomas Sander

A Mechanism for Policy-Driven Selection of Service Providers in SOA and Cloud Environments

Ali Hamidi, Hadi Salimi and Mohsen Sharifi

Network Service Provisioning using System Level Virtualization

Soumaya Marzouk and Mohamed Jmaiel

Low Cost Checkpoint/Rollback Solution for Strong Mobility of Orchestrated Web Services

Maha Jebalia, Asma Ben Lettaifa and Sami Tabbane

A Survey of Live Migration in Virtual Network Environment (VNE)

# KEYNOTES SPEAKERS of the WORKSHOPS

## Cloud services as Cloud of services

**Samir Tata**

TELECOM SudParis -Evry, France

**Biography:** Samir Tata is a Professor in the Computer Science Department at TELECOM SudParis, (member of Institut TELECOM, France), His current research area includes service-oriented computing and business process management with an emphasis on the description and support of process interaction in virtual enterprises. More information can be found at http://www-inf.itsudparis.eu/~tata.

**Wajdi Louati**

TELECOM SudParis -Evry, France

**Biography:** Wajdi LOUATI received the MS and Ph.D Degrees in Computer Science from the Pierre et Marie Curie University (Paris 6), Paris, France, in 2003 and 2006 respectively. He is currently a research fellow at TELECOM SudParis (member of Institut TELECOM), Evry, France, in the Wireless Networks and Multimedia Services department. His main research interests include Network Virtualization, Cloud Networking and Future Internet Design with a current focus on autonomic allocation and management of virtual networks. He is involved in several national and European projects including SAIL, 4WARD, HORIZON and MAGNET.

**Abstract :** This talk will revisit the definition of the concepts of Cloud computing and cloud services and present how SOA and service computing can play a core role in organizing cloud services as composition/orchestration of services (cloud of services). The first part of the talk discusses the requirements of using SOA in the cloud in terms of description, discovery, and composition. Service management approaches are presented to deal with availability and scalability representing mains challenge of using service orientation in the Cloud. The second part of the talk addresses different approaches and mechanisms for Cloud networking. A virtual network provisioning framework is presented to interconnect heterogeneous Cloud

computing infrastructures. Optimisation algorithms for efficient virtual machine deployment, instantiation, monitoring and migration are explored.