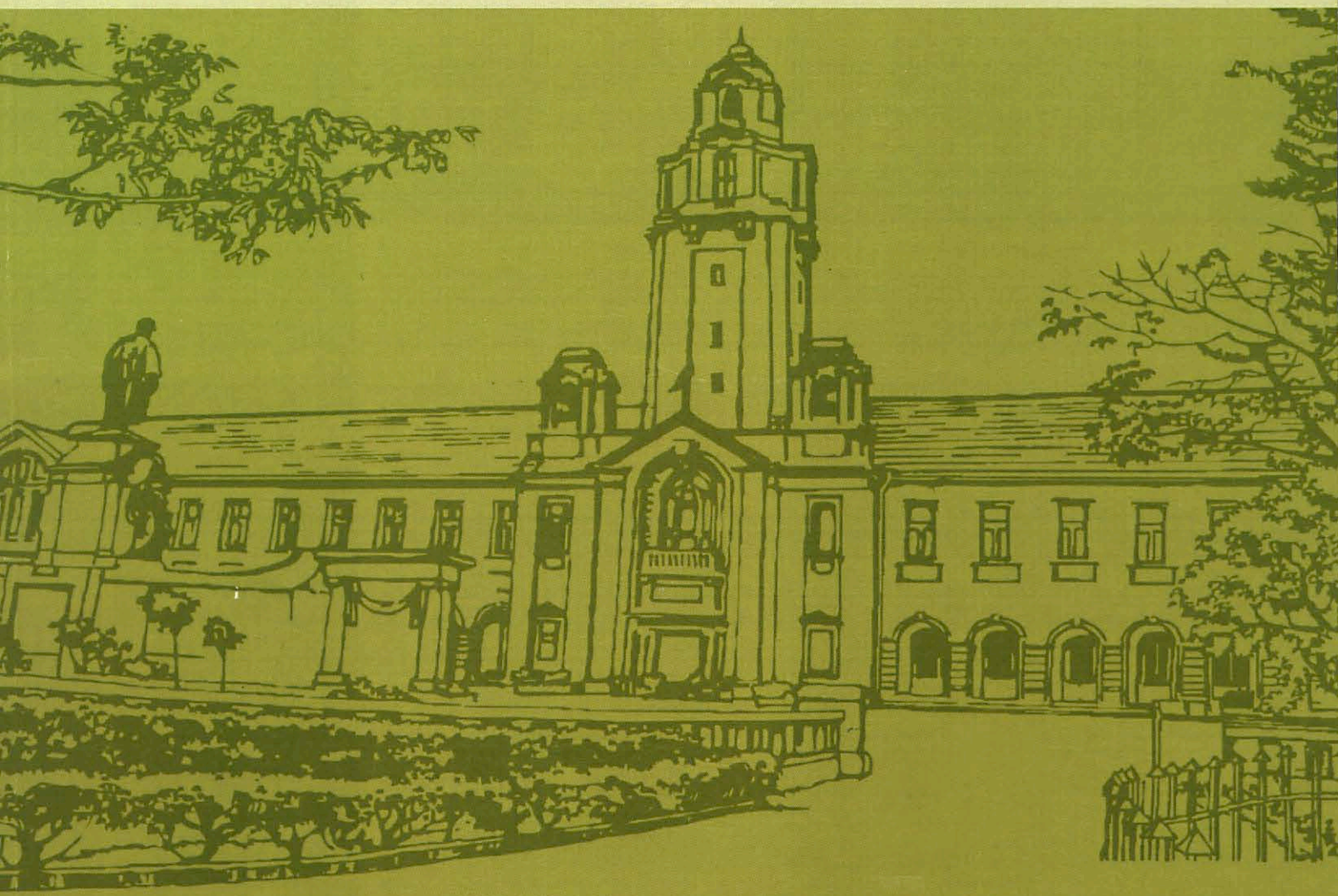
The Fifth IEEE International Conference on Automation Science and Engineering

IEEE CASE 2009

August 22 - 25, 2009, Bangalore, India



SPONSORS

IEEE

IEEE Robotics & Automation Society

IEEE Bangalore Section

Indian Institute of Science Bangalore

Council for Scientific and Industrial Research New Delhi

Department of Information Technology New Delhi

Infosys Technologies Bangalore

Spansion Inc.

Qualtech Systems Inc.

WELCOME MESSAGE FROM PROGRAM CHAIR AND CO-CHAIRS

Welcome to IEEE CASE 2009!

This year CASE received 214 submissions and after a rigorous, peer-reviewed process, it accepted 118 of them (an acceptance rate of about 55%). Among the 118 accepted papers, 82 are contributed submissions, organized in the following six tracks: (i) Foundations of Automation, (ii) Manufacturing, Logistics and Supply Chain Management Systems, (iii) Automation in Meso, Micro and Nano-Systems, (iv) Sensors and Sensor Networks, (v) Automation in Life Sciences and Health Care, and (vi) Automation and Knowledge Sciences. The remaining 36 accepted papers are organized in 9 special sessions that address core and emerging themes in automation related-research, and bring together leading researchers from academia and industry. The particular titles of these nine sessions are as follows: (i) Advances in Petri Net theory, (ii) Algorithmic and Composable Automation, (iii) Analytical Models for Warehouse Design and Operations, (iv) Applying the Scientific Method in Service Engineering, (v) Automation for Yield Symptom Identification in Semiconductor Manufacturing, (vi) Diagnostics and Prognostics, (vii) Health Care Enterprise Automation: Integration Issues, (viii) Testing and Verification of Embedded Control Systems, and (ix) The Role of ICT in Sustainable Manufacturing Systems. We should also mention that the session on Advances in Petri Net theory is a memorial to our excellent colleague, Laura Recalde, who left us in 2008. Her memory will be with us forever!

IEEE CASE 2009 is honored to have three excellent plenary talks, to be delivered by the following distinguished speakers: Prof. Peter Luh of the University of Connecticut, Storrs, Mr. S. (Kris) Gopalakrishnan of the Infosys Technologies, Bangalore, and Prof. Karl Böhringer of the University of Washington, Seattle. In addition, the opening day of the conference comprises 4 tutorials and 4 workshops on topics of extensive interest to the automation community, and delivered by leading researchers in the corresponding areas. A detailed listing of the 4 tutorials and their organizers has as follows: (i) Cyber-Physical Systems (P.R. Kumar, University of Illinois, Urbana Champaign, USA), (ii) Sensor Networks for Automation Applications (Rajeev Shorey, General Motors India Science Lab, Bangalore) (iii) Modern Data Mining Techniques for Automation (Shirish Shevade, Indian Institute of Science, Bangalore, and Balaraman Ravindran, Indian Institute of Technology-Madras), and (iv) Auctions and Mechanism Design (Y. Narahari, Indian Institute of Science, Bangalore, Dinesh Garg, Yahoo! Labs, Bangalore). The themes and the organizers of the 4 workshops are: (i) Knowledge Automation Applications in Service Centers (Ram Akella, Raghuram Krishnapuram, Shantanu Godbole and Kartik Viswesvaraiah), (ii) Sense Making with Smart Phones (Gaurav S. Sukhatme, Mani Srivastava and Venkat Padmanabhan), (iii) Service Science and Automation (N. Viswanadham, S. Kameshwaran Vinayaka Pandit and Sameep Mehta), (iv) Product Life Cycle Management and Design Automation (B. Gurumoorthy, Michael Yu Wang, Ram D. Sriram, G.K. Ananthasuresh and Rachuri Sudarsan).

Finally, following the tradition of past IEEE CASEs, IEEE CASE 2009 will bestow two primary awards: The Spansion™ Best Conference Paper Award and the Qualtech Systems, Inc. Best Application Paper Award. The Awards Committee has already selected four finalists for these two awards, who will present their work in the Best Conference and Application Paper Session. The final decisions will be based on the deliberations of the Awards Committee, the quality of the provided presentations, and also, on input received by the session attendees. The two awards will be announced and presented during the Conference Banquet.

Closing this message, we would like to thank the Conference Organizing and Program Committee, the organizers of the Conference Tutorials, Workshops and Special Sessions, as well as all the Paper Reviewers, for their efforts in soliciting and providing the content of all the aforementioned events, and for ensuring and supporting its superb technical quality. The Conference Steering Committee

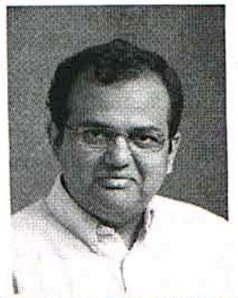
provided valuable feedback and guidance throughout the entire span of the organization process; we are thankful for them. We want also to take the opportunity to extend our special thanks to Pradeep Misra for his support with PaperCept, Inc., and for all his advice and accumulated wisdom that helped us organize our work and address any emerging nuances in the most effective and efficient manner. We also thank OMNIPRESS, Inc., for all the help in preparing and developing the conference proceedings and digest. Finally, we want to thank all of you; your interest, contributions and participation in IEEE CASE 2009 is at the core of the success of this event!

We hope that you will enjoy the conference and your stay in Bangalore!

Program Chair
Spyros Reveliotis
Georgia Institute of Tech, USA

Program Track Chair
Maria Pia Fanti
Politecnico di Bari, Italy

Program Track Chair
P. S. Sastry
Indian Institute of Science, India



Program Track Chair
Gaurav Sukhatme
University of Southern California, USA

Program Track Chair
Dawn Tilbury
University of Michigan, USA

Program Track Chair
Xiaolan Xie
Ecole Natl. Superieure des Mines de Saint-Etienne, France

Program Track Chair
Mingjun Zhang
University of Tennessee, USA

Special Sessions Chair
Jingshan Li
University of Kentucky, USA

Tutorial Chair
Jianjun Shi
Georgia Institute of Tech, USA

WELCOME MESSAGE FROM PROGRAM CHAIR AND CO-CHAIRS

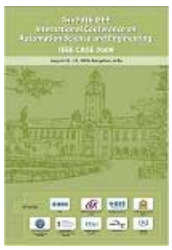
Welcome to IEEE CASE 2009!

This year CASE received 214 submissions and after a rigorous, peer-reviewed process, it accepted 118 of them (an acceptance rate of about 55%). Among the 118 accepted papers, 82 are contributed submissions, organized in the following six tracks: (i) Foundations of Automation, (ii) Manufacturing, Logistics and Supply Chain Management Systems, (iii) Automation in Meso, Micro and Nano-Systems, (iv) Sensors and Sensor Networks, (v) Automation in Life Sciences and Health Care, and (vi) Automation and Knowledge Sciences. The remaining 36 accepted papers are organized in 9 special sessions that address core and emerging themes in automation related-research, and bring together leading researchers from academia and industry. The particular titles of these nine sessions are as follows: (i) Advances in Petri Net theory, (ii) Algorithmic and Composable Automation, (iii) Analytical Models for Warehouse Design and Operations, (iv) Applying the Scientific Method in Service Engineering, (v) Automation for Yield Symptom Identification in Semiconductor Manufacturing, (vi) Diagnostics and Prognostics, (vii) Health Care Enterprise Automation: Integration Issues, (viii) Testing and Verification of Embedded Control Systems, and (ix) The Role of ICT in Sustainable Manufacturing Systems. **We should also mention that the session on Advances in Petri Net theory is a memorial to our excellent colleague, Laura Recalde, who left us in 2008. Her memory will be with us forever!**

CASE 2009

Special Session 11

Home
Registration
Plenary Speakers
Technical Program
Tutorials and Workshops
Special Sessions
Awards
Venue
Travel
Tourism
Accommodation
Sponsors and Exhibitors
Organizing Committee
Program Committee
News and Updates
Important Dates
Call for Papers
Paper Submission
Special Events
Photo Gallery
IEEE CASE 2007
IEEE CASE 2008
IEEE CASE 2010
Contact Us



Special Session: Advances in Petri Net Theory (In Memory of Laura Recalde)

Sunday, August 23, 2009, 16.00 - 18.00 Hours

Coordinators:
Alessandro Giua, Universita' di Cagliari, Italy
Spyros Reveliotis, Georgia Institute of Technology, USA
Manuel Silva, Centro Politécnico Superior, Spain

Venue:
Chanakya B, Hotel Lalit Ashok, Bangalore

Schedule:

- **Time:** 16:00-16:30, Paper SuA2.1
  Title: Performance Control of Markovian Petri Nets Via Fluid Models: A Stock-Level Control Example (I)
  Authors: Vázquez, Carlos Renato Univ. de Zaragoza
  Silva, Manuel Univ. de Zaragoza

- **Time:** 16:30-17:00, Paper SuA2.2
  Title: Maximally Permissive Deadlock Avoidance for Multithreaded Computer Programs (Extended Abstract) (I)
  Authors: Wang, Yin Univ. of Michigan
  Liao, Hongwei Univ. of Michigan
  Nazeem, Ahmed Georgia Tech.
  Reveliotis, Spiridon Georgia Inst. of Tech.
  Kelly, Terence HP Lab.
  Mahlke, Scott Univ. of Michigan
  Lafortune, Stéphane The Univ. of Michigan

- **Time:**17:00-17:30, Paper SuA2.3
  Title: On-Line Fault Diagnosis in a Petri Net Framework (I)
  Authors: Dotoli, Mariagrazia Pol. di Bari
  Fanti, Maria Pia Pol. di Bari

Mangini, Agostino Marcello Pol. di Bari
Ukovich, Walter Univ. of Trieste

- **Time:** 17:30-18:00, Paper SuA2.4
  Title: A Control Oriented Model of Generalized Warehouses Based on Colored Timed Petri Net (I)
  Authors: Basile, Francesco Univ. di Salerno
  Chiacchio, Pasquale Univ. di Salerno
  Del Grosso, Domenico Univ. degli studi di Salerno

In Memoriam of

Prof. Laura Recalde

IEEE CASE

Bangalore,

23th august 2009

PROF. LAURA RECALDE, died on 27th December 2008.

- Associate Professor of **Systems Engineering and Automatic Control** at the University of Zaragoza
- Taught courses as ***System Theory***, ***Control Systems of Chemical Processes***, and ***Discrete Event Systems***.
- Served six times as a PC member of the **International Conference on Application and Theory of Petri Nets**
- Since January 2006 was an Associate Editor of the **IEEE Trans. on Automation Science and Engineering.**
- Her research was focused on the modeling of DESs, and techniques for their **structural analysis and synthesis**.
- **An outstanding professional and a remarkable person.**
- We will never forget her insatiable curiosity, moderation, endearing closeness and bewitching smile, so frequent, sincere and contagious. **She will always be alive among us.**

In Memoriam of prof. Laura Recalde

1. A satellite event of ICAT Petri Nets'09, Paris.
   Tutorial: ***Continuous Petri Nets: Expressivity, Analysis and Control***

   A. Giua, S. Haddad & M. Silva
2. A special session in the

   IEEE Int. Conf. On AUTOMATION SICENCE & ENGINEERING, Bangalore, August, 2009

   S. Reveliotis, A. Giua & M. Silva
3. Opening and *In Memoriam* session:

   IFAC Int. Conf. On Analysis and Design of Hybrid Systems, Zaragoza, September, 2009

   The Organization & IPC Committees

INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

3rd IFAC Conference on Analysis and Design of Hybrid Systems

ADHS'09

Zaragoza, Spain — September 16-18, 2009

Organization Committe co-Chair

Opening & In Memoriam session

In Memoriam of
Prof. Laura Recalde
IEEE CASE
Bangalore,
23th august 2009

In Memoriam of prof. Laura Recalde

Contents
I. Introduction.
II. Basic Concepts on continuous PN.
III. Control & Approximation.
IV. Implementation of Control.
V. Application Example.
VI. Conclusions.

Circular Mutex Wait Deadlocks in Multithreaded Computer Programs
The correct execution of multithreaded computer programs necessitates that certain elements of the underlying operating system, like I/O ports, registers and other parts of memory, files, etc., be engaged by the various program threads in an exclusive manner.
These elements are treated as "resources" and their allocation is controlled by associating a "pass" with each of them, known as "mutex lock".
Program threads competing for various resources, must acquire the corresponding mutex locks before utilizing these resources. Mutex locks are released by the threads upon the completion of the relevant tasks. Threads executing part of their code that requires the acquisition of certain locks are said to execute in their "critical region"
The above mutex lock allocation pattern can give rise to circular waiting conditions where certain threads are permanently stalled, because each of them already holds some locks and requests for its further advancement some other lock(s) that are held by other threads in this set. This situation is characterized as a "Circular Mutex Wait Deadlock"

Generalized Warehouse Material Handling Systems
The items can be mainly classified in:
Unit Loads
Less Than Unit Loads
Identity of each Item is essential for the control.
The resources, instead, belong to the following categories:
Automated Vehicles (Automated Guided Vehicles, Rail Guided Vehicles)
Manned Vehicles (Motor Driven Vehicles, Manually Operated Vehicles)
On-foot Storemen.

5
MINUTES

Thanks

Gracias

IEEE
IEEE CASE 2009
Fifth International Conference o
Automation Science and Engineer
August 22 – 25, 2009 | Bangalore, India
Research