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## Mirosław MALEK

Advanced Learning and Research Institute ([ALaRI](#)) until 2018

Faculty of Informatics ([Informatics](#))

Università della Svizzera italiana – University of Lugano ([USI](#))

### **Office Address and Phone:**

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### **Motto of our Education:**

*"Tell me and I will forget,  
Show me and I will remember,  
Engage me and I will understand"*

Confucius (551–479 BC)

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## Biography

Mirosław Malek, Professor at Advanced Learning and Research Institute (ALaRI-until 2018) at the Faculty of Informatics at University of Lugano (USI). Malek received the M.Sc. degree in Electrical Engineering (Electronics) and the Ph.D. degree in Computer Science in 1975, both from the Technical University of Wrocław, Poland. In 1977, he was a visiting scholar at the Department of Systems Design at the University of Waterloo, Waterloo, Ontario, Canada, then Assistant, Associate, and Full Professor at the University of Texas at Austin (1977 - 1994) where he was also a holder of the Bettie Margaret Smith and the Southwestern Bell Professorships in Engineering. From 1994 until 2012 he

was professor and holder of Chair in Computer Architecture and Communication at the Department of Computer Science at the Humboldt University in Berlin.

Malek's research interests focus on dependable and secure architectures and services in parallel, cloud, distributed and embedded computing environments with emphasis on failure prediction using machine learning and data analytics. He has participated in two pioneering parallel computer projects, contributed to the theory and practice of parallel network design, developed the comparison-based method for system diagnosis, co-developed comprehensive WSI and networks testing techniques, proposed the consensus-based framework for responsive (fault-tolerant, real-time) computer systems design and has made numerous other contributions, reflected in over 300 publications and nine books.

He has organized, chaired, and been a program committee member of numerous IEEE and ACM international conferences and workshops. He serves or served on the editorial boards of the ACM Computing Surveys, Journal of Parallel and Distributed Computing, Journal of Interconnection Networks and Real-Time Systems Journal.

He has supervised 30 Ph.D. dissertations (ten of his students are professors) and three habilitations and founded, organized and co-organized numerous workshops and conferences. He is consultant to startup companies, government and multinational corporations on technical and strategic directions and activities in information technology. He delivered numerous Keynote Addresses and taught short courses in Europe, Asia and North America.

Malek was Visiting Professor at Stanford, Università di Roma "La Sapienza", Politecnico di Milano, Technical University in Vienna, New York University, Chinese University of Hong Kong, held an IBM Chair at Keio University, and was Visiting Scientist at Bell Laboratories and IBM T.J. Watson Research Center.

## **Research**

### **Failure prediction and proactive maintenance**

We have developed effective methods of failure prediction that can be used to avoid computer system failures or minimize their impact. Using such methods in proactive (predictive) maintenance may significantly reduce the total cost of ownership. We cover the entire process from monitoring, through feature selection and failure prediction to failure avoidance or impact. Please note that there is a number of research problems to be solved: we need to know what features to monitor, how frequently, with how many monitors including the placement of such monitors in preferably non-evasive manner. Selection of the most indicative features is another challenge, especially that our research shows that quality of features is more important than the quality of the model. Next we need to select or invent most effective prediction algorithm. Finally, once we know that there is an imminent failure we have to devise appropriate mitigation techniques. After successful applications in computer industry we also applied such methods for healthcare (heart failure prediction), early malware detection and power distribution networks (smart grids).

### **Dependability, real time, responsiveness and security**

With ever-increasing system complexity, new services and new requirements keeping the systems running flawlessly is one of the main challenges. We focus on design of fault-tolerant and secure systems and services that can operate correctly even in the presence of faults. We address problems of diagnosis, recovery. I proposed comparison-based models for fault diagnosis whose applications range from selecting fault-free units on a wafer to identifying faulty servers in parallel and distributed systems. We also look at smart phone security and early attack detection in such systems using feature selection and machine learning.

### **Parallel, distributed and embedded systems**

I codeveloped one of the first parallel computers based on banyan interconnection network called Texas Reconfigurable Array Computer (TRAC) and participated in the Research Parallel Processor Project (RP3) at IBM. This experience was transferred to distributed and embedded environments. One of our objectives is to successfully “marry” computer clouds and Internet of Things into an efficient, dependable and secure assembly of massive data processing. We research cooperative scheduling, consensus and localization/placement algorithms to accomplish this goal.

## **Courses**

### **Dependable Systems**

**Course type:** Lecture

**Value in ECTS:** 3

### **Overview of the Course**

Fast growth and proliferation of computer and communication, and especially embedded systems, forces the increased demand for properties such as dependability, timeliness and security. In this course, we focus on dependability but references to other two properties are also included. After introducing the various dependability perspectives on system design as well as the methodology of dependable design, we introduce basic concepts, measures and models used in dependable computing and communication. We then describe testing methods, fault diagnosis, fault recovery and fault tolerance techniques that are essential in the dependable systems design. We conclude the course with case studies, which demonstrate what techniques have been used for the dependability enhancement in the real life systems and outline the current trends.

### **Contents**

- Introduction, Motivation and Scope (1 hour)
- Project Assignment (1hour)
- Dependability Concepts and Measures (3 hours)
- Teams Formation, Concept Definition and Project Topics(2 hours)
- Dependability Modeling and Tools(4 hours)

- Testing Techniques(2 hours)
- Project and Assignments(2 hours)
- Fault Diagnosis Techniques (2 hours)
- Fault Recovery and Fault Tolerance Techniques (2 hours)
- Dependable and Fault-Tolerant Memories (2 hours)
- Project and Assignments (2 hours)
- Dependable and Fault-Tolerant Software (3 hours)
- Case Studies (2 hours)
- Current Trends (autonomic, trustworthy and proactive computing) (1 hour)
- Project (2 hours)
- Project Presentations (4-5 hours, depending on the number of teams)

## **Introduction to Embedded Systems**

### **Overview of the course**

Embedded systems increasingly pervade all walks of our lives where applications range from agriculture and healthcare to energy, manufacturing and social networks. The course will provide an overview of embedded systems, including cyber-physical systems.

Basic concepts and forms of computing in embedded systems will be discussed and properties such as real time, dependability, safety and security will be covered. Basic scheduling techniques will be introduced as well as key protocols for wireless communication.

Then main operating systems and processor architectures used in the embedded systems will be reviewed followed by applications case studies and trends.

### **Contents**

- Introduction
- World of embedded systems
- Real-time systems
- Scheduling and worst-case execution time (WCET)
- Dependability and safety
- Security

- Wireless Communication (IrDA, WLAN, Bluetooth, ZigBee, GSM, UMTS)
- Real-time communication
- Busses
- Group communication and consensus
- Clock synchronisation
- Operating systems basics
- Operating systems: RealTime Linux, Windows CE, OSEK and PURE OS
- Processor architectures for embedded systems: ARM
- Processor architectures for embedded systems: AVR
- Asynchronous processors
- Low Power – basic techniques
- Radio Frequency Identification (RFID)
- Case studies and trends

### **Designing and Managing Embedded Applications**

The course is structured in two parts: a first part, based on “conventional” lectures, and a second part that will directly involve students in interactive training.

**Part 1:** Problem formalization and identification of constraints: hypotheses, constraints and specification. Problem decomposition and solution techniques: Modeling the unavailable parts of the solution: from system identification to learning from data; Dealing with complexity: a deterministic vs. a probabilistic approach; System optimization techniques: selecting the appropriate figures of merit. Assessment of the solution.

**Part 2:** The course is built on real-world examples that naturally show how the theory emerges from the application needs. The interactive part of the course will guide students through the various steps: Brainstorming techniques; dealing with a complex design space or use of multi-objective optimization and integration; verifying design assumptions; quantifying and checking the models obtained against real-world measures.

### **Technology Project Management and Leadership**

**Course type:** Lecture

**Value in ECTS:** 3

**Contents**

The course is structured in series of seminars on leadership, project and product management and entrepreneurship.

## **Activities**

### **Previous Academic Positions:**

Professor and Chair of Computer Architecture and Communication, Humboldt-Universitaet, Berlin, Germany July 1994 - September 2012

Professor - The University of Texas at Austin, USA, 1977 - 1994

- The University of Texas at Austin, Visiting Assistant Professor, 1977-1979
- The University of Texas at Austin, Assistant Professor, 1979-1983
- The University of Texas at Austin, Associate Professor, 1983-1989
- The University of Texas at Austin, Professor, 1989-94
- The University of Texas at Austin, Bettie Margaret Smith Professorship in Engineering, 1989-91
- The University of Texas at Austin, Southwestern Bell Foundation Endowed Professorship in Engineering, 1991-94

### **Other Professional Experience (two months or longer):**

- Consiglio Nazionale delle Ricerche (CNR), Professor and Scientist, Pisa, 2002
- Bell Labs, Lucent Technologies, Visiting Research Scientist, Murray Hill, NJ, 1996
- IBM Corporation, T.J. Watson Research Center, Yorktown Heights, New York, Visiting Research Scientist, 1985
- IBM Corporation, T.J. Watson Research Center, Yorktown Heights, New York, Visiting Research Scientist, 1984
- IBM Corporation, Austin, Texas, Visiting Research Scientist, 1981
- University of Waterloo, Canada, Research Fellow, 1977
- Technical University of Wroclaw, Adjunct, 1976
- Arup Company, London, System Analyst, 1973

### **Sabbaticals (two months or longer):**

- IBM-Japan Chair, Keio University, Yokohama, Japan
- Stanford University, USA
- New York University, USA
- Universita di Roma "La Sapienza", Italy
- Chinese University of Hong Kong
- Technische Universität Wien, Austria
- Princeton University, USA

**Main Research and Development Contributions:**

Comparison diagnosis models (MM- and MM\*-model)

Two pioneering parallel computer projects (co-designed and co-implemented first-ever multistage network-based system)

Theory and practice of parallel network design (especially hybrid circuit and packet switched protocol)

Comprehensive WSI, comparison-based method for system diagnosis networks testing (design an implementation)

Failure prediction techniques (co-developed and implemented)

Consensus- based framework for responsive (fault-tolerant, real-time) computer systems design

**Honors and Awards:**

- Rector's Prize for Ph.D. Dissertation at Technical University of Wroclaw, Poland
- The Texas Atomic Energy Research Foundation Centennial Fellowship in Electrical Engineering
- Bettie Margaret Smith Professorship in Engineering
- Senior Member, Institute of Electrical and Electronics Engineers
- Subject Area Editor, Journal of Parallel and Distributed Computing
- Listed in American Men and Women of Science
- Southwestern Bell Foundation Endowed Professorship in Engineering
- Editorial Board Member: Journal of Real-Time Systems
- Editorial Board Member: Journal of Internet Engineering

- Subject Area Editor, Journal of Parallel and Distributed Computing
- Associate Editor: ACM Computing Surveys
- Advisory Board Member: Journal of Interconnection Networks
- Steering Committee Member: European Dependable Computing Conference (EDCC)
- Steering Committee Member: International Service Availability Symposium (ISAS)

**Memberships in Professional and Honorary Societies:**

Association for Computing Machinery

Institute of Electrical and Electronics Engineers (IEEE)

IEEE Computer Society

IEEE Technical Committees on

Dependable Computing and Fault Tolerance Computer Architecture Distributed Processing Real-Time Systems (Member of Advisory Committee)

**Funding:**

Extensive experience in managing research teams, developing and delivering quantifiable results in numerous research projects, chairing a number of academic committees as well as the Department of Computer Science at the Humboldt University in Berlin. Principal or Co-Principal Investigator on over 60 projects, many of them multi-million endeavours, involving most prominent foundations and companies including among others:

- US National Science Foundation
- Microelectronics and Computer Consortium
- Defense Advanced Research Projects Agency (DARPA)
- Office of Naval Research (ONR)
- IBM Corporation
- Microsoft Corporation
- Bell Labs, AT&T
- Intel Corporation
- General Research Corporation
- System Development Corporation
- Kokusai Denshin Denwa Co. (KDD-Japan)



- National Institute of Information and Communications Technology (NICT- Japan)
- European Commission
- German Research Foundation (Deutsche Forschung Gemeinschaft)
- German Ministry for Research and Technology (Bundesministerium für Forschung und Technik - BMFT)
- German Ministry for Economy and Technology (Bundesministerium für Wirtschaft und Technik - BMWT)
- Federal Office of Information Security (Bundesamt für Sicherheit der Information - BSI)
- Daimler AG
- Siemens AG
- Hasler Foundation

**Professional Activities:**

19th European Dependable Computing Conference (EDCC-20), Program Committee Member, Leuven, Belgium, April 8-11, 2024

10th International Workshop on Software Aging and Rejuvenation (WoSAR 2018), Program Committee Member, Memphis, USA, October 18, 2018

10th International Workshop on Software Engineering for Resilient Systems (SERENE 2018), Program Committee Member, Iasi, Romania, September 10, 2018

9th International Workshop on Software Aging and Rejuvenation (WoSAR 2017), Program Committee Member, Toulouse, France, October 26, 2017

6th D-A-CH+ Energy Informatics Conference, 2016, Program Committee Member, Lugano, Switzerland, October 4-5, 2017

13th European Dependable Computing Conference (EDCC-13), Program Committee Member, Geneva, Switzerland, September 6-8, 2017

9th International Workshop on Software Engineering for Resilient Systems (SERENE 2017), Program Committee Member, Geneva, Switzerland, September 4-5, 2017

16th International Workshop on Assurance in Distributed Systems and Networks (ADSN2017), General Chair, Atlanta, USA, June 5, 2017

5th D-A-CH+ Energy Informatics Conference, 2016, Program Committee Member, Klagenfurt, Austria, September 29-30, 2016.

2016 IEEE Cyber Science and Technology Congress (CyberSciTech 2016), General Co-Chair, Auckland, New Zealand, August 8-12, 2016.

IEEE Services 2016, Emerging Technology Track on Dependable and Secure Services (DSS 2016), Program Committee Member, San Francisco, USA, June 27- July 1, 2016.

15th International Workshop on Assurance in Distributed Systems and Networks (ADSN2014), General Chair, Nara, Japan, June 27, 2016.

12th Workshop on Dependability and Fault Tolerance, VERFE'16, Program Committee Member, Nuremberg, Germany, April 4 – 7, 2016.

14th International Workshop on Assurance in Distributed Systems and Networks (ADSN2014), General Chair, Columbus, Ohio, USA, June 29, 2015.

11th Workshop on Dependability and Fault Tolerance, VERFE'15, Program Committee Member, Porto, Portugal, March 24- 27, 2015.

4th Workshop on Open Systems Dependability, WOSD'14, Program Committee Member, Ottawa, Canada, November 4, 2014.

13th International Workshop on Assurance in Distributed Systems and Networks (ADSN2014), General Chair, Madrid, Spain, June 30, 2014.

10th Workshop on Dependability and Fault Tolerance, VERFE'14, Program Committee Member, Porto, Portugal, February 25 - 28, 2014.

3rd International Workshop on Open Systems Dependability, WOSD'14, Program Committee Member, Pasadena, California, USA, November 3, 2013.

12th International Workshop on Assurance in Distributed Systems and Networks (ADSN2013), General Chair, Philadelphia, USA, July 8, 2013.

9th Workshop on Dependability and Fault Tolerance, VERFE'13, Program Committee Member, Prague, Czech Republic, February 19-22, 2013.

18th Pacific Rim International Symposium on Dependable Computing (PRDC 2012), Program Committee Member, Nigata, Japan, November 18-19, 2012.

3rd International Symposium on Multidisciplinary Emerging Networks and Systems (MENS2012), Fukuoka, Japan, September 4, 2012.

11th International Workshop on Assurance in Distributed Systems and Networks (ADSN2012), Program Vice- Chair Macau, China June 18, 2012.

17th Pacific Rim International Symposium on Dependable Computing (PRDC 2011), Program Committee Member, Pasadena, California, USA, December 12-14, 2011.

3rd IEEE International Workshop on Software Aging and Rejuvenation (WoSAR 2011), Program Committee Member, Hiroshima, Japan, 29 November – 2 December 2011.

10th IEEE Symposium on Network Computing and Applications (NCA11), Program Committee Member, Cambridge, USA, August 25 – 27, 2011.

41st Annual IEEE/IFIP International Conference on Dependable Systems and Networks, Program Committee Member, Hong Kong, June 27-30, 2011.

DSN 2011 Workshop on Proactive Failure Avoidance, Recovery and Maintenance (PFARM 2011), Co-Chair, Hong Kong, June 27-30, 2011.

5th Latin-American Symposium on Dependable Computing (LADC), Program Committee Member, Sao Paulo, Brasil, April 25-29, 2011.

10th International Workshop on Assurance in Distributed Systems and Networks (ADSN2011), Program Committee Member, Hiroshima, Japan, March 26-27, 2011.

1st Workshop on Software-Controlled, Adaptive Fault-Tolerance in Microprocessors, Program Committee Member, Como, Italy, February 22, 2011.

16th Pacific Rim International Symposium on Dependable Computing (PRDC 2010), Program Committee Member, Tokyo, Japan, December 13-15, 2010.

2nd IEEE International Workshop on Software Aging and Rejuvenation (WoSAR 2010), Program Committee Member, San Jose, California, USA, November 2, 2010.

RACOS 2010 : 1st International Workshop on Resilience Assessment of COMplex Systems, Program Committee Member, Delhi, India, October 31, 2010.

1st International Conference on Parallel, Distributed and Grid Computing, Program Committee Member, Wagnaghat, Solan, Himachal Pradesh, India, October 28-30, 2010.

2nd International Symposium on Multidisciplinary Emerging Networks and Systems (MENS2012), Xi'an, China, October 26 - 29, 2010.

3rd International Conference on Dependability (DEPEND 2010), Program Committee Member, Venice/Mestre, Italy, July 18 - 25, 2010.

9th IEEE Symposium on Network Computing and Applications (NCA10), Program Committee Member, Cambridge, USA, July 15-17, 2010.

9th International Workshop on Assurance in Distributed Systems and Networks (ADSN 2010), Program Chair, Genoa, June 2010.

DSN 2010 Workshop on Proactive Failure Avoidance, Recovery and Maintenance (PFARM 2010), Co-Chair, Chicago, June 2010.

Workshop on Isolation and Integration for Dependable Systems (IIDS), Program Committee Member, Co-located with EuroSys'2010, Paris, France, April 13, 2010.

6th Workshop on Dependability and Fault Tolerance, in connection with ARCS 2009, Program Committee Member, Delft, The Netherlands, March 10-13, 2009.

3rd IEEE TCSC Doctoral Symposium in conjunction with the 9th IEEE International Symposium on Cluster Computing and the Grid (CCGrid 2009), Program Committee Member, Shanghai, China, 18.21. Mai 2009.

4th Latin-American Symposium on Dependable Computing (LADC), Program Committee Member, Joao Pessoa, Brasil, September 1-4, 2009.

11th International Symposium on Stabilization, Safety and Security of Distributed Systems (SSS 2009), Program Committee Member, Lyon, France, November 3-6, 2009.

1st Workshop on Field Failure Data Analysis: Challenges and Approaches (F2DA 2009), Workshop Committee Member, Niagara Falls, New York, USA, September 27-30, 2009.

EuroSys Workshop on Virtualization Technology for Dependable Systems (VTDS'09), Program Committee Member, 2009.

15th Pacific Rim International Symposium on Dependable Computing (PRDC 2009). Program Committee Member, 2009.

2nd International Conference on Dependability (DEPEND 2009), Program Committee Member, 2009.

6th IFIP International Conference on Network and Parallel Computing, Program Committee Member, 2009.

8th IEEE Symposium on Network Computing and Applications (NCA09), Program Committee Member, Cambridge, USA, July 9-11, 2009.

1st Workshop on Field Failure Data Analysis: Challenges and Approaches (F2DA 2009), Program Committee Member, 2009.

8th International Workshop on Assurance in Distributed Systems and Networks (ADSN 2009), Program Vice Chair, 2009.

DSN 2009 Workshop on Proactive Failure Avoidance, Recovery and Maintenance (PFARM 2009), Co-Chair, Lisbon, June, 2009.

3rd IEEE TCSC Doctoral Symposium in conjunction with the 9th IEEE International Symposium on Cluster Computing and the Grid (CCGrid 2009), Program Committee Member, Shanghai, China, May 18-21, 2009.

6th Workshop on Dependability and Fault Tolerance (in connection with ARCS), Program Committee Member, Delft, Netherlands, March 10-13, 2009.

13<sup>th</sup> International Symposium on Pacific Rim Dependable Computing (PRDC), Program Committee Member, Taipei, Taiwan, December 15-17, 2008.

11<sup>th</sup> IEEE High Assurance Systems Engineering Symposium (HASE 08), Program Committee Member, Nanjing, China, December 3-5, 2008.

SRDS2008 Workshop on Sharing Field Data and Experiment Measurements on Resilience of Distributed Computing Systems, Program Committee Member, Naples, Italy, October 2008.

7<sup>th</sup> IEEE Symposium on Network Computing and Applications (NCA08), Program Committee Member, Cambridge, USA, July 10-12, 2008.

7<sup>th</sup> International Workshop on Assurance in Distributed Systems and Networks (ADSN 2008), Program Vice Chair, Beijing, China, June 20, 2008.

7<sup>th</sup> European Dependable Computing Conference (EDCC-7), Program Committee Member, Kaunas, Lithuania, May 7-9, 2008.

13<sup>th</sup> International Symposium on Pacific Rim Dependable Computing (PRDC), Program Committee Member, Melbourne, Australia, December 17-19, 2007.

26<sup>th</sup> IEEE Symposium on Reliable Distributed Systems (SRDS-26), Program Committee Member, Beijing, China, October 10-12, 2007.

6<sup>th</sup> International Symposium on Network Computing and Applications (NCA07), Program Committee Member, Boston, USA, July 12-14, 2007.

6<sup>th</sup> International Workshop on Assurance in Distributed Systems and Networks (ADSN2007), Program Vice-chair, Toronto, Canada, June 29, 2007.

37<sup>th</sup> Annual IEEE/IFIP International Conference on Dependable Systems and Networks, Program Committee Member, Edinburgh, Scotland, June 25-28, 2007.

4<sup>th</sup> International Service Availability Symposium, ISAS2007, Program Committee Member, Durham, New Hampshire, USA, May 21-22, 2007.

12<sup>th</sup> Workshop on Dependable Parallel, Distributed and Network-Centric Systems, Program Committee Member, Long Beach, California, USA, March 26-30, 2007.

5<sup>th</sup> Workshop "Dependability and Fault Tolerance, Program Committee Member, Zurich, Switzerland, March 15, 2007.

International Symposium on Service-Oriented System Engineering (SOSE2006), General Co-Chair, Shanghai, China, October 25-27, 2006.

6<sup>th</sup> European Dependable Computing Conference (EDCC-6), Program Committee Member, Coimbra, Portugal, October 18-20, 2006.

The Fifth International Conference on Assurance in Distributed Systems and Networks (ADSN2006), Program Committee Chair, Lisbon, Portugal, July 2006.

3<sup>rd</sup> International Service Availability Symposium, ISAS2006, Program Committee Member, Helsinki, Finland, May 15-16, 2006.

11<sup>th</sup> Workshop on Dependable Parallel, Distributed and Network-Centric Systems, Program Committee Member, Rhode Island, Greece, April 25-29, 2006.

4th Workshop "Dependability and Fault Tolerance, Program Committee Member, Johann Wolfgang Goethe Universität, Frankfurt a. M., Germany, March 16, 2006.

24<sup>th</sup> Symposium on Reliable Distributed Systems (SRDS2005), Program Committee Member, Orlando, Florida, USA, October 26-28, 2005.

High Assurance Systems Engineering (HASE 05), Program Committee Member, Heidelberg, Germany, October 12-14, 2005.

8th Euromicro Conference on Digital System Design (DSD), Program Committee Member, Porto, Portugal, August/September 2005.

4<sup>th</sup> International Workshop on Assurance in Distributed Systems and Networks (ADSN), Vice Program Chair, Columbus, Ohio, USA, June 2005.

5<sup>th</sup> International Conference on Application of Concurrency to System Design (ACSD), Program Committee Member, St. Malo, France, June 2005.

5<sup>th</sup> European Dependable Computing Conference (EDCC5), Student Forum Chair, Budapest, Hungary, April 2005.

2<sup>nd</sup> International Service Availability Symposium (ISAS2005), General Chair Berlin, April 2005.

10<sup>th</sup> IEEE Workshop on Dependable Parallel, Distributed and Network-Centric Systems, Program Committee Member, Denver, Colorado, USA, together with: 19<sup>th</sup> International Parallel and Distributed Processing Symposium, April 4-8, 2005.

23<sup>rd</sup> Symposium on Reliable Distributed Systems, Program Committee Member, Florianópolis, Brazil, October 18-20, 2004.

Euromicro Symposium on Digital Systems Design, DSD 2004, Program Committee Member, Rennes, France, August 31 - September 3, 2004.

International Conference on Dependable Systems and Networks, DSN, Program Committee Member, Florence, Italy, June 28 - July 1, 2004.

1<sup>st</sup> International Service Availability Symposium, ISAS, Program Chair, Munich, May 13-14, 2004. 2<sup>nd</sup> IEEE Workshop on Software Technologies for Embedded and Ubiquitous Computing Systems, Program Committee Member, Vienna, Austria, May 11-12, 2004.

9<sup>th</sup> IEEE Workshop on Fault-Tolerant Parallel, Distributed and Network-Centric Systems, Program Committee Member, Santa Fe, New Mexico, USA, April 26-30, 2004.

Computing Frontiers 2004, Program Committee Member, Ischia, Italy, April 14-16, 2004.

22<sup>nd</sup> Symposium on Reliable Distributed Systems, SRDS, Program Co-Chair, Florence, Italy, October 2003.

4<sup>th</sup> European Dependable Computing Conference, EDCC-4, Toulouse, October 22-25, 2002.

10<sup>th</sup> International Workshop on Parallel and Distributed Computing Real-Time Systems, WPDRTS 2002, Fort Lauderdale, Florida, April 15-16, 2002.

4<sup>th</sup> IEEE International Symposium on Object-Oriented Real-Time Distributed Computing, ISORC 2001, Program Committee Member, Magdeburg, May 2 -4, 2001.

20<sup>th</sup> IEEE Symposium on Reliable Distributed Systems (SRDS-20), Program Committee Member, New Orleans, USA, 2001.

High Performance Computing Conference, Steering Committee Member, Bangalore, India, December 17 -20, 2000.

19<sup>th</sup> IEEE Symposium on Reliable Distributed Systems (SRDS-19), Program Committee Member, Nürnberg, Oktober 16 -19, 2000.

Annual IEEE Workshop on Fault-Tolerant Parallel and Distributed Systems, Program Committee Member, Cancun, Mexico, May 1 - 5, 2000.

3<sup>rd</sup> International Workshop on Communication-Based Systems, Program Committee Member, TU Berlin, March 31 - April 1, 2000.

High Performance Computing Conference, Steering Committee Member, Calcutta, India, December 17 - 20, 1999.

European Dependable Computing Conference (EDCC-3), Program Committee Member, Prague, Czech Republic, September 15 - 17, 1999.

29<sup>th</sup> Fault-Tolerant Computing Symposium, Program Committee Member, Madison, Wisconsin, July 1999.

European Conference on Health-Telematics, Program Committee Member, Berlin, May 27 -28, 1999.

Sixth Workshop on Parallel and Distributed Real-Time Systems, Program Committee Member, San Juan, Puerto Rico, April 12, 1999.

High Performance Computing Conference Chennai (Madras), Steering Committee Member, December 17 - 20, 1998

1<sup>st</sup> Euromicro Workshop on Network Computing, Program Committee Member, Vaesteras, Sweden, August 25 - 27, 1998.

1998 International Conference on Parallel Processing (ICPP '98), Program Committee Member, Minneapolis, USA, August 10 - 15, 1998.

The 3<sup>rd</sup> World Conference on Integrated Design & Process Technology, Conference Co-Chairman, Berlin, July 6 - 9, 1998.

1<sup>st</sup> IEEE International Symposium on Object-oriented Real-time distributed Computing (ISORC '98), Program Committee Member, Kyoto, Japan, April 20 -22, 1998.

9<sup>th</sup> European Workshop on Dependable Computing (EWDC-9), Program Committee Member, Gdansk, Poland, April 16 - 18, 1998.

Sixth International Workshop on Parallel and Distributed Real-Time Systems (WPDRTS) and the 4<sup>th</sup> Workshop on Object-Oriented Real-Time Systems (OORTS), Program Committee Member, Orlando, FL, USA, March 30 - April 3, 1998.

4<sup>th</sup> International Conference on High Performance Computing (HiPC'97), Steering Committee Member, Bangalore, India, December 18-21, 1997.

Workshop on Analytical and Numerical Modelling Techniques with the Application to Quality of Service (QoS) Modelling, Program Committee Member, Singapore, September 1 -4, 1997.

5<sup>th</sup> Workshop on Parallel and Distributed Real-Time Systems. WPDRTS'97, Program Committee Member, Geneva, Switzerland, April 1-3, 1997.

Youth Forum in Computer Science and Engineering (YUFORIC) Theme: Real-Time Technology and Applications, Program Committee Member Keio University, Mita, Tokyo, Japan, October 27, 1996.

Second European Dependable Computing Conference (EDCC-2), Program Committee Member, Taormina, Italy, October 2 - 4, 1996.

IEEE International Workshop On Embedded Fault-Tolerant Systems, Program Committee member, Fairmont Hotel, Dallas, Texas, September 9-10, 1996.

The 1996 IEEE International Workshop on Dependability in Advanced Computing Paradigms (DACP-96), Program Committee Member, Hitachi-city, Ibaraki, Japan, June 20-21, 1996.

Analytical and Numerical Modelling Techniques Conference, Program Committee Member, Budapest, June 2-6, 1996.

International Conference on Configurable Distributed Systems, Program Committee Member, Annapolis, Maryland, USA, May 1996.

4<sup>th</sup> International Workshop on Parallel and Distributed Real-Time Systems (WPDRTS), Program Committee Member, Honolulu, Hawaii at The 10<sup>th</sup> IEEE International Parallel Processing Symposium (IPPS) April 15- 16, 1996.

First Conference on Fault-Tolerant Systems: FTS'95, Program Committee Member, I. I. T. Madras, India, December 1995.

The Second International Conference on Massively Parallel Processing using Optical Interconnections (MPPOI), Program Committee Member, San Antonio, TX, October 23 - 24, 1995.

8<sup>th</sup> International Conference on Parallel & Distributed Computing Systems, Orlando, FL, September 20-23, 1995.

14<sup>th</sup> IEEE Symposium on Reliable Distributed Systems, Program Committee Member, Bad Neuenahr, Germany, September 13-15, 1995.



25<sup>th</sup> Annual International Symposium on Fault-Tolerant Computing, Program Committee Member, Pasadena, CA, June 27-30, 1995.

IFIPWG 6.1 Fifteenth International Symposium on Protocol Specification, Testing and Verification, Program Committee Member, Warsaw, Poland, June 13-16, 1995.

International Performance and Dependability Symposium (IPDS'95), Panelist, Erlangen Nuremberg, April 24 - 26, 1995.

15<sup>th</sup> IEEE Real-Time Systems Symposium, Program Committee Member, San Juan, Puerto Rico, December 7-9, 1994.

International Workshop on Composability, Organizing Committee Member and Panel Moderator, San Juan, Puerto Rico, December 6, 1994.

Program Committee Member, Berlin, Germany, September 29-30, 1994.

International Workshop on the Quality of Communication-Based Systems, Guest Editor of Special Issue on Responsive Computing Systems, Real-Time Systems Journal, Vol. 7, No. 3, November 1994.

24<sup>th</sup> Annual International Symposium on Fault-Tolerant Computing, General Chairman, Austin, TX, June 15-17, 1994.

The Second International Workshop on Configurable Distributed Systems, Program Committee Member, Pittsburgh, PA, March 21-23, 1994.

14<sup>th</sup> IEEE Real-Time Systems Symposium, Program Committee Member, Raleigh-Durham, NC, December 1-3, 1993.

Third International Workshop on Responsive Computer Systems, General Chairman, Lincoln, NH, September 29 - October 1, 1993.

ParCo93, Program Committee Member, Grenoble, France, September 7-10, 1993.

23<sup>rd</sup> Annual International Symposium on Fault-Tolerant Computing, Program Committee Member, Toulouse, France, June 22-24, 1993.

Workshop on Models for High-Performance Computing, General Co-Chairman, Warsaw, Poland, May 24-26, 1993.

1992 IEEE Workshop on VLSI Signal Processing, Program Committee Member, Napa, CA, October 28-30, 1992.

Eleventh Symposium on Reliable Distributed Systems, Program Committee Member, Houston, TX, October 5-7, 1992.

Second International Workshop on Responsive Computer Systems, General Co-Chairman, Saitama, near Tokyo, Japan, October 1-2, 1992.

22<sup>nd</sup> Annual International Symposium on Fault-Tolerant Computing, Program Committee Member, Boston, MA, July 8-10, 1992.

International Workshop on Configurable Distributed Systems, Program Committee Member, London, England, March 25-27, 1992.

International Workshop on Responsive Computer Systems, Co-Organizer, Golfe-Juan, France, October 3-4, 1991.

Tenth Symposium on Reliable Distributed Systems, Program Committee Member, Pisa, Italy, September 30 - October 2, 1991.

Fifth International Conference on Fault-Tolerant Computer Systems, Key note Speaker, Nuremberg, Germany, September 25, 1991.

Parallel Computing '91, Program Committee Member, London, England, September 3-6, 1991.

International Conference on Applications-Specific Array Processors, Program Committee Member, Platja d'Aro, Spain, September 2-4, 1991.

21<sup>st</sup> Annual International Symposium on Fault-Tolerant Computing, Program Committee Member, Montreal, Canada, June 25-27, 1991.

Workshop on Parallel Computing for Physical Sciences, Institut National de Recherche en Informatique et en Automatique (INRIA), Program Co-Chairman, Rocquencourt, near Paris, France, December 3-5, 1990.

International Conference on Applications-Specific Array Processors, Program Committee Member, Princeton University, NJ, September 5-7, 1990.

Euromicro90, Sixteenth Symposium on Microprocessing and Microprogramming, Keynote Speaker, Amsterdam, The Netherlands, August 29, 1990.

Tenth International Conference on Distributed Computing Systems, Program Committee Member, Paris, France, May 28 - June 1, 1990.

Eighth Symposium on Reliable Distributed Systems, Program Committee Member, Seattle, WA, October 1989.

Euro micro Workshop on Real-Time Systems, Program Committee Member, Como, Italy, June 1989.

Workshop on Wafer-scale Integration, Program Committee Member, Como, Italy, June 1989.

Workshop on Future Directions in Parallel and Distributed Computing Fault Tolerance, Chairman and Organizer, Chicago, IL, October 1988.

15<sup>th</sup> Annual International Symposium on Computer Architecture, Member of Advisory Committee, June 1988.

IEEE Computer Society Technical Committee on Real-Time Systems, Chairman, January 1, 1986 - December 31, 1987.

1987 Workshop on Fault Tolerance in Parallel and Distributed Computing, General Co-Chairman, San Diego, CA, December 1987.

The International Conference on Distributed Computing Systems, Member of the Program Committee, Berlin (West), Germany, September 1987.

6<sup>th</sup> International Conference on Distributed Computing Systems, Program Chairman for Networks, Boston, MA, 1986.

1984 Real-Time Systems Symposium, General Chairman, Austin, TX.

4<sup>th</sup> International Conference on Distributed Computing Systems, Program Chairman for Architectures, San Francisco, CA, 1984.

1983 Real-Time Systems Symposium, Program Chairman, Arlington, VA.

12<sup>th</sup> International Symposium on Fault Tolerant Computing, Program Committee Member, Los Angeles, CA, June 1982.

9<sup>th</sup> Annual Symposium on Computer Architecture, Program Committee Vice-Chairman, Austin, TX, April 1982.

#### **Further Activities:**

Taught short courses on Dependable Computing, Fault-tolerant Systems, Fault-tolerant Hardware and Fault-tolerant Software in the United States, England and France for IBM Corporation and other companies since 1983 as well as for Advanced Learning and Research Institute in Switzerland.

Speaker, keynote speaker, panelist and lecturer at numerous conferences, workshops and NATO Advanced Study Institute, served on several boards of computer journals.

Guest speaker at various universities and companies in the North America, Europe and Asia.

Editorial Board Member: Journal of Real-Time Systems

Editorial Board Member: Journal of Internet Engineering

Steering Committee Member, European Dependable Computing Conference

Associate Editor, ACM Computing Surveys

## **PhD's completed**

#### **Ph.D. Supervisions Completed:**

##### **Università della Svizzera italiana (USI)**

- Jelena Milosevic, 2017, ALaRI, Faculty of Informatics
- Igor Kaitovic, 2017, ALaRI, Faculty of Informatics
- Katarina Balac, 2019, ALaRI, Faculty of Informatics

### **The University of Texas at Austin**

- James S. Hsu, 1980, Dept. of Electrical and Computer Engineering
- Doug DeGroot, 1981 (cosupervised with J. C. Browne), Dept. of Computer Sciences
- Michael J. Lorenzetti, 1983 (with R. J. Smith II), Dept. of Computer Sciences
- Joonyoul Maeng, 1983, Dept. of Electrical and Computer Engineering
- Eliezer Oppen, 1984, Dept. of Electrical and Computer Engineering
- Heonshik Shin, 1985, Dept. of Electrical and Computer Engineering
- Vladimir Cherkassky, 1985, Dept. of Electrical and Computer Engineering
- Yoon-Hwa Choi, 1986, Dept. of Electrical and Computer Engineering
- Israel Gazit, 1987, Dept. of Electrical and Computer Engineering
- Sang Hyun Han, 1987, Dept. of Electrical and Computer Engineering
- Kitty Hiu Yau, 1989, Dept. of Electrical and Computer Engineering
- Allen M. Johnson, 1989, Dept. of Electrical and Computer Engineering
- Patrick G. Karger, 1989 (cosupervised with R. J. Smith II), Dept. of Electrical and Computer Engineering
- Xian-de Li, 1990, Dept. of Electrical and Computer Engineering
- Luiz A. Laranjeira (cosupervised with R. M. Jenevein, Jr.), 1992, Dept. of Electrical and Computer Engineering
- Mihir Pandya, 1995 Dept. of Electrical and Computer Engineering
- Banu Ozden, 1996 (cosupervised with A. Silberschatz), Dept. of Electrical and Computer Engineering
- Guillaume Brat, 1998 (cosupervised with V. Garg)

### **Informatik, Humboldt-Universität zu Berlin**

- Olaf Riebe, Dept. of Computer Science, 1997
- Matthias Werner, Dept. of Computer Science, 1999
- Holger Karl, Dept. of Computer Science, 1999
- Andreas Polze (habilitation), Dept. of Computer Science, 2001
- Günther Hoffmann, Dept. of Computer Science, 2005

- Jan Richling, Dept. of Computer Science, 2006
- Nikola Milanovic, Dept. of Computer Science, 2006
- Katinka Wolter (habilitation), Dept. of Computer Science, 2008
- Felix Salfner, Dept. of Computer Science, 2008
- Bratislav Milic, Dept. of Computer Science, 2009
- Burak Simsek, Dept. of Computer Science, 2010
- Nikola Milanovic (habilitation), Dept. of Computer Science, Technical University of Berlin, 2010
- Andreas Dittrich, Dept. of Computer Science, Humboldt University of Berlin, 2015

(All in all, 32 completed PhD supervisions, three habilitations and over 100 MS supervisions, 10 PhDs are currently professors at the universities worldwide).