



CECS AT DATE 2012 IN DRESDEN, GERMANY

- Staff

Highlights

- Postdoc Position Available
- DATE 2012
- Visitor Profile: Pyung Soo Kim
- Student Profile: Pei-Yuan Chiang
- ASP-DAC 2012
- HiPEAC 2012



The Design, Automation & Test in Europe (DATE) conference was opened on March 12, 2012 in Dresden, Germany. DATE in Dresden attracted approximately 1,400 experts to the conference plus more than 800 exhibition visitors.

CECS faculty member, Prof. Nikil Dutt presented a workshop session on Coordinated Dependability Programs, where he discussed his collaborative research program funded by the National Science Foundation (NSF,) titled “*Variability Expeditions.*”

The Technical Session on Reconfigurable Computing was chaired by Prof. Fadi Kurdahi with Co-chair Prof. Marco Platzner from the University of Paderborn, Germany. The topic addressed statically and dynamically reconfigurable and reprogrammable systems and components: platforms and architectures, FPGAs, reconfigurable processors, design methods and tools for reconfigurable computing and communication applications.

Prof. Kurdahi, together with Prof. Ahmed Eltawil and CECS alum Amin Khajeh were the organizers

and speakers for the Tutorial Session, *On Variability and Reliability; Dynamic Margining and Low Power.* The objective of this tutorial was to provide an understanding of the fundamentals behind intra and inter die variations as well as the most recent trends in managing process variations. Two case studies on Multimedia and Wireless were presented discussing variation at the application level. Lastly, an analytical framework that models the operating condition and variation induced failures in both logic and memory was presented to explain how low power cross-layer policies could be devised using the framework.

Prof. Tajana Simunic Rosing (CECS UCSD) chaired the Technical Session on Computing and Green IT Systems. This session was devoted to practical design experiences in industrial or academic projects with high industrial relevance targeting high performance, parallel, or information technology systems with a focus on energy efficiency.

Inside this Issue:

Visitor Profile	2
Student Profile	3
ASP-DAC	4
HiPEAC	4
Publications	5
Postdoc Position	6

VISITOR PROFILE

Visitor Profile: Pyung Soo Kim

• Staff

Prof. Pyung Soo Kim is going to stay at the Center for Embedded Computer Systems as a visiting scholar for his sabbatical year. (Hosted by Prof. Pai H. Chou from February 2012 to January 2013)

He received his M.S. in Control and Instrumentation Engineering and his Ph.D. at the School of Electrical Engineering and Computer Science from Seoul National University, Seoul, Korea, in 1996 and 2001, respectively. Emeritus Professor Wook Hyun Kwon at the Seoul National University was his M.S. degree and Ph. D. dissertation advisor. The title of his Ph. D. dissertation is "New Stochastic FIR Filters for State Estimation in State Space Models." From 2001 to 2005, he was a senior researcher at the Digital Media R&D Center of Samsung Electronics Co. Ltd. Since 2005, He has been with the Department of Electronics Engineering at Korea Polytechnic University, Korea.



Prof. Kim has received several awards for outstanding scholarly and creative research activity, and teaching and technology innovations. Notably, he was selected as "Outstanding Researcher of the Year (2004)" at the 35th Anniversary of the founding of Samsung Electronics Co., Ltd. and "Outstanding Professor of the Year (2010)" at the 29th Anniversary of National Teacher Day from the Ministry of Educational Science and Technology, Korea.

He has received numerous research grants from government and industry in the field of wireless mobile networks and statistical signal processing. In addition, he has published numerous articles, 31 international journal papers, 30 international conference papers, and 9 US patents. He is currently teaching and researching wireless mobile networks, Future Internet, optimal state estimation filtering, related subjects, specially focused on:

- Wireless mobile network solutions, such as IP mobility protocols (Mobile IP, Proxy Mobile IP, etc), fast vertical handover for heterogeneous wireless networks, etc.
- Mobility solutions for Future Internet, such as name-based networking, namespace and name systems, identifier/locator separation, and content-centric networking.
- Optimal estimation filtering and its applications for statistical signal processing, mobile positioning and tracking system, aerospace and military systems, battery management systems, etc.
- System software solutions, such as open APIs, device drivers, network protocols, on various operating systems such as Linux, WinCE, etc.

He hopes to contribute to CECS research and to create a cooperative working environment that will provide the opportunity for research collaboration, in the future.

CECS at DATE (continued from page 1)...

At the Special Interest Workshop on “*QuoVadis, Virtual Platforms? Challenges and Solutions for Today and Tomorrow*”. Prof. Rainer Doemer was invited to present his paper titled “*Recoding Embedded Applications into Flexible System-Level Modes*” This workshop brought together developers, researchers, and managers from industry and academia to develop a perspective for the future use of Virtual Platforms by exchanging knowledge about current and future requirements and their possible solutions.

CECS Ph.D. students and affiliates also presented papers/posters in the Interactive Presentations and Technical Sessions:

Luis Angel D. Bathen: VaMV-Variability-aware Memory Virtualization, Interactive Presentation, Tuesday, March 13, 2012 (*Best IP Candidate*)

Wei-Wei Chen, X. Han: Out-of-Order Parallel Simulation for ESL Design, Technical Session on Effective Functional Simulation and Validation, Tuesday, March 13, 2012

Yi Wang, Luis Angel D. Bathen: 3D-FlashMap: A Physical-Location-Aware Block Mapping Strategy for 3D NAND Flash Memory, Technical Session on Emerging Memory Technologies, Thursday, March 15, 2012

T. Azumi, Y. Hara-Azumi, R. Doemer, “Virtual Platform Generation Using TECS Software Component and SCE”, Poster Presentation, Special Interest Workshop: *Quo Vadis, Virtual Platforms? Challenges and Solutions for Today and Tomorrow*, Friday, March 16, 2012

Student Profile: Pei-Yuan Chiang

Staff



Pei-Yuan Chiang is a second year Ph.D. student in the EECS department at UC Irvine. He received his Master’s and Bachelor’s degrees in Communication Engineering from National Chiao Tung University, Hsinchu, Taiwan in 2006 and 2008 respectively.

His previous research was mainly focused on CMOS mixer and balun design for astronomy applications. A wideband passive mixer and a low mismatch Marchand Balun were proposed and verified by RF-CMOS 0.13 μ m process with 17GHz IF bandwidth and less than 0.5dB, 1 $^\circ$ degree mismatch which was published in *IEEE Transac-*

tions on Microwave Theory and Techniques in 2010.

In September 2010, he joined the Nanoscale Communication IC Lab (NCIC) at UCI and currently works with Professor Heydari. His research interests include sub-millimeter wave and Terahertz phase locked loop (PLL), transceiver architecture design, imager system, and high frequency phased-array radio. He has been working on a sub-millimeter signal source project, a system which can generate a tunable high frequency signal with low phase noise. This system can be used as an active imager for security check like concealed weapons detection or for chip-to-chip high data rate communication. “It’s challenging to have a tunable and high-power signal in the sub-millimeter frequency range due to the low quality factor of passive components and parasitic capacitors,” Pei-Yuan said.

CECS at ASP-DAC 2012

Staff



The 17th Asia and South Pacific Design Automation Conference (ASP-DAC 2012) was held in Sydney, Australia from January 30 – February 2, 2012. The conference aims at providing

the Asia and South Pacific CAD/DA and Design community with opportunities to present recent advances and with forums for future directions in technologies related to Electronic Design Automation (EDA). CECS faculty member, Prof. Nikil Dutt served on the program committee for *Embedded and Real-Time Systems*. During the Technical Program Special Session on *Making ESL Models Work*, Prof. Rainer Doemer presented an invited paper, titled “Parallel Discrete Event Simulation of Transaction Level Models” and in the session on *Parallelizing System-Level Simulation*, Prof. Doemer’s PhD student, Weiwei Chen gave a presentation on her paper “An Optimizing Compiler for Out-of-Order Parallel ESL Simulation Exploiting Instance Isolation.”



Prof. Fadi Kurdahi featured as Keynote Speaker at HiPEAC 2012



The 7th HiPEAC conference took place in Paris, France on January 23-25, 2012. The conference provides a forum for experts in computer architecture, programming models, compilers, and operating systems for embedded and general-purpose systems. The conference aims at the dissemination of advanced scientific knowledge and the promotion of international contacts among scientists from academia and industry.

CECS Associate Director, Prof. Fadi Kurdahi delivered a keynote speech titled “Cross-Layer Design of Reconfigurable Systems for Resilient Applications” at the Workshop on Reconfigurable Computing.

The main focus of this workshop was on reconfigurable architectures, tools and algorithms that facilitate such systems and applications tailored for reconfigurable platforms. The workshop intends to bring together hardware designers and software developers that make extensive use of reconfigurable computing, enabling scientific discussion regarding future challenging issues.



PUBLICATIONS

The following papers were published by CECS affiliates between January 2012 to March 2012 (and unreported papers from previous eNews).

Focus	Title, Author, Publication	Conference Proceedings
ESL Design	W. Chen, X. Han, R. Doemer, “ Out-of-Order Parallel Simulation for ESL Design, ”	Proceedings of Design Automation and Test in Europe (DATE), Dresden, Germany, March 12-16, 2012
Transaction Level Models	Rainer Doemer, Weiwei Chen, Xu Han, “ Parallel Discrete Event Simulation of Transaction Level Models, ”	ASP-DAC, Sydney, Australia, Jan. 30 – Feb. 2, 2012: 227-231 (Invited Paper)
ESL Simulation	Weiwei Chen, Rainer Doemer, “ An Optimizing Compiler for Out-of-Order Parallel ESL Simulation Exploiting Instance Isolation, ”	ASP-DAC, Sydney, Australia, Jan. 30 – Feb. 2, 2012: 461-466
Virtual Platform Generation	T. Azumi, Y. Hara-Azumi, R. Doemer, “ Virtual Platform Generation Using TECS Software Component and SCE ”, “ QuoVadis, Virtual Platforms? ”	Workshop at Design Automation and Test in Europe (DATE), Dresden, Germany, March 12-16, 2012
System-Level Models	R. Doemer, “ Recoding Embedded Applications into Flexible System-Level Models ”, Invited Paper, “ Quo Vadis, Virtual Platforms? ”	Workshop at Design Automation and Test in Europe (DATE), Dresden, Germany, March 12-16, 2012
Memory Virtualization	Luis Bathen, Nikil Dutt, “ VaMV: Variability-aware Memory Virtualization, ”	Design Automation and Test in Europe (DATE), Dresden, Germany, March 12-16, 2012
Block Mapping	Yi and Luis Bathen, Nikil Dutt, “ 3D-FlashMap: A Physical-Location-Aware Block Mapping Strategy for 3D NAND Flash Memory, ”	Design Automation and Test in Europe (DATE), Dresden, Germany, March 12-16, 2012
Video Playback	Kiarash Amiri, Shih-Hsien Yang, Fadi J. Kurdahi, Magda El Zarki, Aditi Majumder, “ Collaborative video playback on a federation of tiled mobile projectors enabled by visual feedback, ”	MMSys 2012, Chapel Hill, NC, USA, Feb. 22-24, 2012: 113-118
Assistive Monitoring	Alex D. Edgcomb, Frank Vahid, “ MNFL: the monitoring and notification flow language for assistive monitoring, ”	ACMIHI 2012: 191-200
Testing, Medical Ventilator	Bailey Miller, Frank Vahid, Tony Givargis, “ Digital mockups for the testing of a medical ventilator, ”	ACM International Health Informatics Symposium, IHI 2012, Miami, FL, USA, Jan. 28-30, 2012: 859-862
Thermal and Cooling Management	Raid Zuhair Ayoub, Rajib Nath, Tajana Rosing, “ JETC: Joint energy thermal and cooling management for memory and CPU subsystems in servers, ”	The 18 th IEEE International Symposium on High Performance Computer Architecture, HPCA 2012, New Orleans, LA, USA, Feb. 25-29, 2012: 299-310
		Journal Articles
Intersection Protocols	Emiliano De Cristofaro, Gene Tsudik, “ On the performance of certain Private Set Intersection protocols ”, (And some remarks on the recent paper by Huang et al. in NDSS’12).	IACR Cryptology ePrint Archive 2012: 54 (2012)
Pervasive Computing	Marco Conti, Sajal K. Das, Chatschik Bisdikian, Mohan Kumar, Lionel M. Ni, Andrea Passarella, George Roussos, Gerhard Tröster, Gene Tsudik, Franco Zambonelli, “ Looking ahead in pervasive computing: Challenges and opportunities in the era of cyber-physical convergence, ”	Pervasive and Mobile Computing 8(1): 2-21 (2012)

continued on next page...

PUBLICATIONS & POSTDOC

The following papers were published by CECS affiliates between January 2012 to March 2012 (and unreported papers from previous eNews) - continued from page 5...

Focus	Title, Author, Publication
Voltage Scaling	Avesta Sasan, Kiarash Amiri, Houman Homayoun, Ahmed M. Eltawil, Fadi J. Kurdahi, “ Variation Trained Drowsy Cache (VTD-Cache): A History Trained Variation Aware Drowsy Cache for Fine Grain Voltage Scaling, ” IEEE Trans. VLSI Syst. 20(4): 630-642 (2012)
Middleware Execution Efficiency	Jie Tang, Shaoshan Liu, Zhimin Gu, Xiao-Feng Li, Jean-Luc Gaudiot, “ Achieving middleware execution efficiency: hardware-assisted garbage collection operations, ” The Journal of Supercomputing 59(3): 1101-1119 (2012)
Autocalibration	Behzad Sajadi, Aditi Majumder, “ Autocalibration of Multiprojector CAVE-Like Immersive Environments, ” IEEE Transactions on Visualization and Computer Graphics. 18(3): 381-393 (2012)
Adaptive Frameworks	Chengmo Yang, Alex Orailoglu, “ Tackling Resource Variations Through Adaptive Multicore Execution Frameworks, ” IEEE Trans. on CAD of Integrated Circuits and Systems 31(1): 132-145 (2012)
ESE	Kyoungwon Kim, “ TLM Generation in ESE, ” CECS Technical Report TR 12-02, February 20, 2012. Posted February 27, 2012
HDRL	Kazuyuki Tanimura and Nikil Dutt, “ A Standard Cell-Based DPA Attack Countermeasure using Homogeneous Dual-Rail Logic (HDRL), ” CECS Technical Report TR 12-01, January 25, 2012. Posted January 27, 2012

POSTDOCTORAL SCHOLAR POSITION AVAILABLE IN CYBER-PHYSICAL SYSTEMS

The Center for Embedded Computer Systems at the University of California, Irvine (<http://www.cecs.uci.edu>) is seeking a postdoc in the area of cyber-physical systems, researching new methods for specification, real-time emulation, and test/debug of embedded computing systems interacting tightly with real/emulated physical systems. Desired features include a strong systems building and C/C++ background; experience with embedded and real-time systems, control systems, FPGAs, microcontrollers, and Linux/Unix; and an established publication record. Further experience with medical devices, instrumentation, data acquisition, Matlab/LabView, and HDLs and synthesis tools would be ideal. The ability to lead Ph.D. students will be helpful.

The postdoc will join an outstanding and active CECS research team including professors and Ph.D. students from both UC Irvine and UC Riverside. The position will be at UC Irvine, with its outstanding southern California weather, proximity to the beach and numerous southern California attractions, and extensive on-campus and near-campus housing options. The team has an outstanding research track record, with Ph.D.s and postdocs commonly obtaining positions in top universities and companies. The salary will be commensurate with training and experience.

Candidates can send a CV or a request for further information to Tony Givargis at givargis@uci.edu and copy vahid@cs.ucr.edu and gajski@uci.edu.

CECS—promoting creativity and pursuing discovery!

Center for Embedded Computer Systems, University of California, Irvine



CECS Mission Statement:

To conduct leading-edge interdisciplinary research in embedded systems emphasizing automotive, communications, and medical applications, and to promote technology and knowledge transfer for the benefit of the individual and society.

CECS eNews

Center for Embedded Computer Systems
3211 Engineering Hall
University of California, Irvine
Email: enews@cecs.uci.edu

CECS Research Advisory Board

Dr. Sanjiv Narayan, Vice President &
Managing Director, Calypto Design
Systems, New Delhi, India
Dr. Dinesh Ramanathan, Executive Vice
President, Cypress Semiconductor,
San Jose, CA
Dr. Yervant Zorian, Chief Architect,
Synopsys Inc., Fremont, CA

