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BIOGRAPHY

Tulika Mitra is a Professor (with tenure) of Computer Science at School of Computing, National University of Singapore. She received her PhD from the State University of New York at Stony Brook (2000) and M.E. from the Indian Institute of Science (1997), both in Computer Science.

Her research interests span various aspects of the design automation in the context of embedded real-time systems, cyber-physical systems (CPS), and Internet of Things (IoT) with particular emphasis on energy-efficient computing, heterogeneous computing, application-specific processors, and software timing analysis/optimizations. She has authored over hundred scientific publications in premier international journals and conferences in this domain. Her research has been recognized by best paper award at FPT 2012 and best paper nominations at DAC (2016, 2012, 2009), DATE 2017, VLSI 2013, CODES+ISSS 2008, FPL 2007, ECRTS 2007, and CASES (2016, 2007). She is co-inventor of the widely used Chronos static timing analysis tool for real-time software. Her research has been funded by Ministry of Education Singapore, National Research Foundation Singapore, A*STAR Science & Engineering Research Council, Cambridge Silicon Radio, Huawei, and in-kind contributions from ARM. Prof. Mitra is the winner of the Indian Institute of Science (IISc) Prof. S. K. Chatterjee Outstanding Woman Researcher Award 2017

Prof. Mitra serves as the Deputy Editor-in-Chief of IEEE Embedded Systems Letters (IEEE ESL), Senior Associate Editor of the ACM Transactions on Embedded Computing Systems (ACM TECS), and Associate Editor of the IEEE Design & Test Magazine, EURASIP Journal on Embedded Systems. She was Associate Editor of the IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE TCAD) and IET Computers & Digital Techniques in the past. She is/was the program chair of the ACM/IEEE International Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES 2017 & 2018), ACM/IEEE International Conference on Embedded Software (EMSOFT 2014), program vice-chair of the Asia and South Pacific Design Automation Conference (ASPDAC 2015), general chair of the IEEE International Conference of Field Programmable Technology (FPT 2011), program chair & general chair of the IEEE Symposium on Application-Specific Processors (SASP 2009 & 2010), track chair of the IEEE Real-Time Systems Symposium (RTSS 2018), track chair of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2015), subcommittee/topic chair for several editions of the Design Automation Conference (DAC) and the Design Automation & Test in Europe (DATE) conference. She has served in the program committees of almost all major conferences in the embedded systems, real-time systems, and design automation domain. She has also served as a member of the INRIA Evaluation Panel and Computer Science Panel of Swedish Research Council.

At NUS, Prof. Mitra is a member of the University Promotion and Tenure Committee (UPTC) since 2017. She is serving as the Deputy Head (Special Programme) of the Computer Science Department since 2016. She was the chair of the Joint Academic Committee for the Computer Engineering Programme for four years.

RESEARCH INTERESTS

Design automation of embedded real-time systems, cyber-physical systems (CPS), and Internet of Things (IoT) with particular emphasis on energy-efficient computing, heterogeneous computing, application-specific processors, and software timing analysis/optimizations.

EDUCATION

- **Ph.D.** Computer Science, State University of New York (SUNY) at Stony Brook, December 2000
- **M.E.** Computer Science, Indian Institute of Science (IISc) Bangalore, January 1997
- **B.E.** Computer Science, Jadavpur University, Kolkata India, July 1995

EMPLOYMENT

- **2015–** Professor, Computer Science, National University of Singapore
- **2008–2014** Associate Professor, Computer Science, National University of Singapore
- **2001–2007** Assistant Professor, Computer Science, National University of Singapore
- **Aug–Dec 2008** Visiting Professor, Computer Science & Automation, Indian Institute of Science
- **1998–2000** Research Assistant, State University of New York at Stony Brook
- **1997** Summer Research Intern, Sandia National Laboratories, Albuquerque, New Mexico
- **1997** Teaching Assistant, State University of New York at Stony Brook
- **1994** Summer Research Intern, Bhabha Atomic Research Centre, Kolkata, India

HONORS & AWARDS

- Indian Institute of Science (IISc) Prof. S. K. Chatterjee Outstanding Woman Researcher Award 2017
- School of Computing Teaching Excellence Award 2006
- Best Paper Award, 11th IEEE International Conference of Field Programmable Technology (FPT) 2012
- Best Paper Candidate, Design Automation and Test in Europe (DATE) 2017
- Best Paper Candidate, 53rd ACM/IEEE Design Automation Conference (DAC) 2016
- Best Paper Candidate, ACM International Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES) 2016
- Best Paper Candidate, 26th International Conference on VLSI Design (VLSI) 2013
- Best Paper Candidate, 49th ACM/IEEE Design Automation Conference (DAC) 2012
- Best Paper Candidate, 46th ACM/IEEE Design Automation Conference (DAC) 2009
- Best Paper Candidate, ACM International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS) 2008
- Best Paper Candidate, 17th International Conference on Field Programmable Logic and Applications (FPL) 2007
- Best Paper Candidate, 19th Euromicro Conference on Real-Time Systems (ECRTS) 2007

- Best Paper Candidate, 7th ACM/IEEE International Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES) 2007
- Best Paper Candidate, 4th ACM/IEEE International Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES) 2004
- ACM Doctoral Dissertation Award Nomination by SUNY at Stony Brook 2001
- Computer Society Medal for first position, CS Department, Indian Institute of Science 1997.
- Samsung Scholarship 1996–1997
- Dr. B. C. Roy Memorial Medal for first position, Engineering Faculty, Jadavpur University 1995
- University Medal for first position, CS Department, Jadavpur University 1995.
- National Scholarships for 13th position in Secondary Examination (Grade 10) and 17th position in Higher Secondary Examination (Grade 12) in the state of West Bengal, India

TEACHING HISTORY

- **CS1104 Computer Organization** (2001, 2006, 2007)
- **CS2271 Embedded Systems** (2001, 2002, 2004)
- **CG2271 Real-Time Operating Systems** (2016, 2017)
- **CS4273 Embedded Software Design Project** (2009, 2010, 2012)
- **CS4223 Multi-Core Architectures** (2011, 2012, 2013, 2014, 2015, 2016, 2017)
- **CS5272 Embedded Software Design** (2004, 2005, 2006, 2007, 2013, 2014, 2015)
- **CS5221 Parallel Computer Systems** (2002, 2003, 2005)
- **CS5222 Advanced Processor Architectures** (2008, 2009, 2010, 2011)

RESEARCH GRANTS

1. [PI] “Many-core Architecture Design for LTE Base Station”, National Research Foundation Industry-IHL Partnership Grant with Huawei International, 2016-2019 **S\$1,275,240**
2. [PI] “Software Support for Heterogeneous Multi-Cores in Dark Silicon Era” Academic Research Council, Ministry of Education, 2016-2019 **S\$449,850**
3. [PI] “Universal SoC: Automatic Generation of High-Performance SoCs for the Internet of Things”, Academic Research Council, Ministry of Education, 2015-2018 **S\$655,290**
4. [PI] “Monsoon: Energy and Thermally Efficient Adaptation of Embedded Computing Systems”. Academic Research Council, Ministry of Education, 2013-2015 **S\$772,260**
5. [PI] “Bahurupi : Polymorphic Heterogeneous Multi-Core Systems”. Academic Research Council, Ministry of Education, 2009-2012 **S\$806,020**
6. [PI] “Dynamic Thermal Management for Heterogeneous MPSoCs”. Cambridge Silicon Radio (CSR), 2011-2015 **S\$276,316**
7. [PI] “Transformer Core”. Huawei Technologies Co Ltd., 2013-2016 **S\$262,600**
8. [PI] “Computation Model for 3D Multi-Core Systems”. NUS Faculty Research Committee (FRC) Academic Research Fund, 2012-2015 **S\$71,740**
9. [PI] “Techniques to Support Timing and Power Guarantees for Embedded Code”. NUS University Research Committee (URC) Academic Research Fund, 2003–2007, **S\$231,100**

10. [PI] “Probabilistic Timing Analysis of Embedded Software”. NUS Faculty Research Committee (FRC) Academic Research Fund, 2009–2011, **S\$30,000**
11. [PI] “Designing Customizable Multiprocessor Systems-on-Chips”. NUS Faculty Research Committee (FRC) Academic Research Fund, 2007–2009, **S\$52,500**
12. [PI] “Selecting the Appropriate Processor for an Embedded Application”. NUS Faculty Research Committee (FRC) Academic Research Fund, 2001–2004, **S\$61,200**
13. [Co-PI] “EASEL: Engineering Architectures and Software in the Embedded Landscape” [PI: Weng-Fai Wong]. Science & Engineering Research Council A*STAR, 2006–2009, **S\$1,399,000**
14. [Co-PI] “FLARES: Flexible Architecture for Embedded System” [PI: Weng-Fai Wong]. Science & Engineering Research Council A*STAR, 2003–2005, **S\$486,490**
15. [Co-PI] “Correctness and Performance Issues in the CLI Memory Model” [PI: Abhik Roychoudhury]. Microsoft Corporation, 2005–2006, **US\$15,000** + **S\$16,000** matching grant from NUS Faculty Research Committee (FRC) Academic Research Fund.
16. [Co-PI] “A Compilation Framework for Reconfigurable Computing” [PI: Weng-Fai Wong]. Science & Engineering Research Council, A*STAR, 2001–2002, **S\$34,000**
17. [Co-PI] “Efficient Design Space Exploration of Embedded Systems” [PI: Abhik Roychoudhury]. Multi-disciplinary research initiative for InfoComm & InfoTech Institute (ICITI), NUS, 2003–2005, **S\$75,000**
18. [Senior Personnel] “A Multi-Level Approach to Power-Efficient Opto-Electronic Interconnection Network” [PI: Li-Shiuan Peh]. National Science Foundation (NSF) Information Technology Research (ITR), 2003–2006, **US\$550,000**
19. “Multimedia File System”, USENIX Student Research Grant, 1997–1998, **US\$21,000**

PATENTS

- Polymorphic Heterogeneous Multi-Core Architecture. US Patent US 20140331236 A1 granted 2014
- Fusible and Reconfigurable Cache Architecture. US Patent US 20150234744 A1 granted 2015
- Data Processing Method and Device in Cache Coherence Directory Architecture. US Patent filed 2015

PUBLICATIONS

- *Application-Specific Processors*. Tulika Mitra. Book chapter in “Handbook of Hardware/Software Code-sign”, Springer 2017 [**Invited Book Chapter**]
- *Power Management of Asymmetric Multi-Cores in the Dark Silicon Era*. Tulika Mitra, Thannirmalai Somu Muthukaruppan, Anuj Pathania, Mihai Pricopi, Vanchinathan Venkataramani, Sanjay Vishin. Book chapter in *The Dark Side of Silicon (Computing in the Dark Silicon Era)*, Springer 2017 [**Invited Book Chapter**]
- *Accelerating Data Analytics Kernels with Heterogeneous Computing*. Guanwen Zhong, Alok Prakash, Tulika Mitra. Book Chapter in *Emerging Technology and Architecture for Big-data Analytics*, Springer 2017 [**Invited Book Chapter**]
- [INFOCOM’18] *PR3: Power Efficient and Low Latency Baseband Processing for LTE Femtocells*. Nishant Budhdev, Mun Choon Chan, Tulika Mitra. IEEE International Conference on Computer Communications, April 2018 (Forthcoming)
- [ACM-TECS’17] *LOCUS: Low-Power Customizable Many-Core Architecture for Wearables*. Cheng Tan, Aditi Kulkarni, Vanchinathan Venkataramani, Manupa Karunaratne, Tulika Mitra, Li-Shiuan Peh. ACM Transactions on Embedded Computing Systems (Forthcoming) **Invited: Special Issue on Best Papers from Embedded Systems Week 2016**

- [IEEE-TPDS'17] *TC-Release++: An Efficient Timestamp-Based Coherence Protocol for Many-Core Architectures*. Yuan Yao, Wenzhi Chen, Tulika Mitra, Yang Xiang. IEEE Transactions on Parallel and Distributed Systems 28(11), November 2017
- [ACM-TECS/CODES+ISSS'17] *CGPredict: Embedded GPU Performance Estimation from Single-Threaded Applications*. Siqi Wang, Guanwen Zhong, Tulika Mitra. ACM Transactions on Embedded Computing Systems. Special Issue on ACM/IEEE International Conference on Hardware/Software Code-sign and System Synthesis, October 2017
- [DAC'17] *HyCUBE: A CGRA with Reconfigurable Single-cycle Multi-hop Interconnect*. Manupa Karunaratne, Aditi Kulkarni, Tulika Mitra, Li-Shiuan Peh. 54th ACM/IEEE Design Automation Conference, June 2017
- [IEEE-TCAD'17] *Optimal Greedy Algorithm for Many-Core Scheduling*. Anuj Pathania, Vanchinathan Venkataramani, Muhammad Shafique, Tulika Mitra, Jrg Henkel. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 36(6), June 2017
- [TACO'17] *Defragmentation of Tasks in Many-Core Architectures*. Anuj Pathania, Vanchinathan Venkataramani, Muhammad Shafique, Tulika Mitra, Jrg Henkel. ACM Transactions on Architecture and Code Optimization, 14(1), April 2017
- [DATE'17] *Design Space Exploration of FPGA-based Accelerators with Multi-level Parallelism*. Guanwen Zhong, Alok Prakash, Siqi Wang, Yun Liang, Tulika Mitra, Smail Niar. Design Automation and Test in Europe, March 2017
- [DATE'17] *Scalable Probabilistic Power Budgeting for Many-Cores*. Anuj Pathania, Heba Khdr, Muhammad Shafique, Tulika Mitra, Jrg Henkel. Design Automation and Test in Europe, March 2017 [**Best Paper Candidate**]
- *Power Management of Mobile GPUs*. Tulika Mitra, Alok Prakash, Anuj Pathania. Book chapter in Advances in GPU Research and Practice, Elsevier 2016 [**Invited Book Chapter**]
- [CASES'16] *LOCUS: Low-Power Customizable Many-Core Architecture for Wearables*. Cheng Tan, Aditi Kulkarni, Vanchinathan Venkataramani, Manupa Karunaratne, Tulika Mitra, Li-Shiuan Peh. ACM International Conference on Compilers, Architecture, and Synthesis for Embedded Systems, October 2016 [**Best Paper Candidate**]
- [DFT'16] *Combined On-line Lifetime-Energy Optimization for Asymmetric Multicores*. Cristiana Bolchini, Matteo Carminati, Tulika Mitra, Thannirmalai Somu Muthukaruppan. 29th Defect and Fault Tolerance in VLSI and Nanotechnology Systems Symposium, September 2016
- [DAC'16] *Improving Mobile Gaming Performance through Cooperative CPU-GPU Thermal Management*. Alok Prakash, Hussam Amrouch, Muhammad Shafique, Tulika Mitra, Jörg Henkel. 53rd ACM/IEEE Design Automation Conference, June 2016 [**Best Paper Candidate**]
- [DAC'16] *Lin-Analyzer: A High-level Performance Analysis Tool for FPGA-based Accelerators*. Guanwen Zhong, Alok Prakash, Yun Liang, Tulika Mitra, Smail Niar. 53rd ACM/IEEE Design Automation Conference, June 2016
- [DAC'16] *Distributed Scheduling for Many-Cores Using Cooperative Game Theory*. Anuj Pathania, Vanchinathan Venkataramani, Muhammad Shafique, Tulika Mitra, Jörg Henkel. 53rd ACM/IEEE Design Automation Conference, June 2016
- [ICS'16] *Efficient Timestamp-Based Cache Coherence Protocol for Many-Core Architectures*. Yuan Yao, Guanhua Wang, Zhiguo Ge, Tulika Mitra, Naxin Zhang, Wenzhi Chen. 27th ACM International Conference on Supercomputing, June 2016
- [ICSE'16] *Automated Partitioning of Android Applications for Trusted Execution Environments*. Konstantin Rubinov, Lucia Rosculet, Tulika Mitra, Abhik Roychoudhury. ACM/IEEE International Conference on Software Engineering, May 2016.
- [DATE'16] *Distributed Fair Scheduling for Many-Cores*. Anuj Pathania, Vanchinathan Venkataramani, Muhammad Shafique, Tulika Mitra, Jörg Henkel. Design Automation and Test in Europe, March 2016

- [IEEE-TVMT'16] *Design of Multiple-Target Tracking System on Heterogeneous System-on-Chip Devices*. Guanwen Zhong, Smail Niar, Alok Prakash, Tulika Mitra. IEEE Transactions on Vehicular Technology [Forthcoming]
- [TCAD'15] *Instruction Cache Locking Using Temporal Reuse Profile*. Yun Liang, Tulika Mitra, Lei Ju. IEEE Transactions on Computer Aided Design of Integrated Circuits and Systems 34(9), 2015
- [ICCD'15] *Energy-Efficient Execution of Data-Parallel Applications on Heterogeneous Mobile Platforms*. Alok Prakash, Siqi Wang, Alexandru Eugen Irimiea, Tulika Mitra. 33rd IEEE International Conference on Computer Design, October 2015
- [IPJSJ'15] *Heterogeneous Multi-core Architectures*. Tulika Mitra IPJSJ Transactions on System LSI Design Methodology 8(2015) [**Invited Paper**]
- [DAC'15] *Power-Performance Modelling of Mobile Gaming Workloads on Heterogeneous MPSoCs*. Anuj Pathania, Alexandru Eugen Irimiea, Alok Prakash, Tulika Mitra 52nd ACM/IEEE Design Automation Conference, June 2015
- [DATE'15] *SelectDirectory: A Selective Directory for Cache Coherence in Many-Core Architectures*. Yuan Yao, Guanhua Wang, Zhiguo Ge, Tulika Mitra, Naxin Zhang, Wenzhi Chen. Design Automation and Test in Europe, March 2015
- [CGO'15] *Improving GPGPU Energy-Efficiency through Concurrent Kernel Execution and DVFS*. Qing Jiao, Mian Lu, Huynh Phung Huynh, Tulika Mitra. ACM/IEEE International Symposium on Code Generation and Optimization, February 2015
- [ASPDAC'15] *Approximation-Aware Scheduling on Heterogeneous Multi-core Architectures*. Cheng Tan, Thannirmalai Somu Muthukaruppan, Tulika Mitra, Lei Ju. 20th Asia and South Pacific Design Automation Conference, January 2015
- [TC'14] *Task Scheduling on Adaptive Multi-Core*. Mihai Pricopi, Tulika Mitra. IEEE Transactions on Computers 63(10), 2014
- [TRETS'14] *Graph Minor Approach for Application Mapping on CGRAs*. Liang Chen, Tulika Mitra. ACM Transactions on Reconfigurable Technology and Systems 7(3), 2014 [**Invited paper for special issue on Best Papers from FPT 2012**]
- [ISIC'14] *Energy-Efficient Computing with Heterogeneous Multi-Cores*. Tulika Mitra. International Symposium on Integrated Circuits, December 2014 [**Invited Special Session Paper**]
- [CODES+ISSS'14] *Dark Silicon as a Challenge for Hardware/Software Co-Design*. Muhammad Shafique, Siddharth Garg, Tulika Mitra, Sri Parameswaran, Jörg Henkel. ACM/IEEE International Conference on Hardware/Software Codesign and System Synthesis, October 2014 [**Invited special session paper**]
- [ICCD'14] *Design Space Exploration of Multiple Loops on FPGAs using High Level Synthesis*. Guanwen Zhong, Vanchinathan Venkataramani, Yun Liang, Tulika Mitra, Smail Niar. 32nd IEEE International Conference on Computer Design, October 2014
- [ASPLOS'14] *Price Theory Based Power Management for Heterogeneous Multi-Cores*. Thannirmalai Somu Muthukaruppan, Anuj Pathania, Tulika Mitra. 19th ACM/IEEE International Conference on Architectural Support for Programming Languages and Operating Systems, March 2014
- [DAC'14] *Integrated CPU-GPU Power Management for 3D Mobile Games*. Anuj Pathania, Jiao Qing, Alok Prakash, Tulika Mitra. 51st Design Automation Conference, June 2014
- [DATE'14] *WCET-Centric Dynamic Instruction Cache Locking*. Huping Ding, Yun Liang, Tulika Mitra. Proceedings of the Design Automation and Test in Europe Conference, March 2014
- [TECS'13] *An Analytical Approach for Fast and Accurate Design Space Exploration of Instruction Caches*. Yun Liang, Tulika Mitra. ACM Transactions on Embedded Computing Systems 13(2): 15, December 2013

- [ICCAD'13] *A Just-in-Time Customizable Processor*. Liang Chen, Joseph Tarango, Tulika Mitra, Philip Brisk. 31st ACM/IEEE International Conference on Computer-Aided Design, November 2013
- [CASES'13] *Power-Performance Modeling on Asymmetric Multi-Cores*. Mihai Pricopi, Thannirmalai Somu Muthukaruppan, V Vanchinathan, Tulika Mitra, Sanjay Vishin. ACM International Conference on Compilers, Architecture, and Synthesis for Embedded Systems, October 2013
- [ICCD'13] *Energy-Aware Synthesis of Application Specific MPSoCs*. Thannirmalai Somu Muthukaruppan, Haris Javaid, Tulika Mitra and Sri Parameswaran. 31st IEEE International Conference on Computer Design, October 2013.
- [VLSI-SoC'13] *Implementation of Core Coalition on FPGAs*. Kaushik Mysur, Mihai Pricopi, Thomas Marconi, Tulika Mitra. IFIP/IEEE International Conference on Very Large Scale Integration, October 2013
- [DAC'13] *Hierarchical Power Management for Asymmetric Multi-Core in Dark Silicon Era*. Thannirmalai Somu Muthukaruppan, Mihai Pricopi, V Vanchinathan, Tulika Mitra, Sanjay Vishin. 50th Design Automation Conference, June 2013
- [DAC'13] *Integrated Instruction Cache Analysis and Locking in Multitasking Real-time Systems*. Huping Ding, Yun Liang, Tulika Mitra. 50th Design Automation Conference, June 2013
- [ASPDAC'13] *Shared Cache Aware Task Mapping for WCRT Minimization*. Huping Ding, Yun Liang, Tulika Mitra. 18th Asia and South Pacific Design Automation Conference, January 2013
- [VLSI'13] *Lifetime Reliability Aware Architectural Adaptation*. Thannirmalai Somu Muthukaruppan and Tulika Mitra 26th International Conference on VLSI Design, January 2013 [**Best Paper Candidate**]
- [RTS-Jun'12] *Timing analysis of concurrent programs running on shared cache multi-cores*. Yun Liang, Huping Ding, Tulika Mitra, Abhik Roychoudhury, Yan Li, Vivy Suhendra. Real-Time Systems Journal 48(6), 2012
- [FPT'12] *Graph Minor Approach for Application Mapping on CGRAs*. Liang Chen, Tulika Mitra. Proceedings of the International Conference on Field Programmable Technology, December 2012 [**Best Paper Award**]
- [DAC'12] *WCET-Centric Partial Instruction Cache Locking*. Huping Ding, Yun Liang, Tulika Mitra. Proceedings of the Design Automation Conference, June 2012 [**Best Paper Candidate**]
- [TACO'12] *Bahurupi: A polymorphic heterogeneous multi-core architecture*. Mihai Pricopi, Tulika Mitra. ACM Transactions on Architecture and Code Optimization, 8(4), January 2012
- [DATE'12] *Online Scheduling for Multi-Core Shared Reconfigurable Fabric*. Liang Chen, Thomas Marconi, Tulika Mitra. Proceedings of the Design Automation and Test in Europe Conference, March 2012
- [FPT'11] *A Novel Online Hardware Task Scheduling and Placement Algorithm for 3D Partially Reconfigurable FPGAs*. Thomas Marconi, Tulika Mitra. Proceedings of the International Conference on Field Programmable Technology, December 2011
- [DAC'11] *Shared Reconfigurable Fabric for Multicore Customization*. Liang Chen, Tulika Mitra. Proceedings of the Design Automation Conference, June 2011
- [SASP'11] *Synthesis of Customized MPSoCs for Streaming Applications*. Liang Chen, Nicolas Boichat, Tulika Mitra. Proceedings of the IEEE Symposium on Application-Specific Processors, June 2011
- [TOPLAS'10] *Scratchpad Allocation for Concurrent Embedded Software*. Vivy Suhendra, Abhik Roychoudhury, Tulika Mitra. ACM Transactions on Programming Languages and Systems, 32(4), 2010
- [FPT'10] *Efficient Custom Instructions Generation for System-Level Design*. Huynh Phung Huynh, Yun Liang, Tulika Mitra. Proceedings of the International Conference on Field Programmable Technology, December 2010

- [CASES'10] *Improved Procedure Placement for Set Associative Caches*. Yun Liang, Tulika Mitra. Proceedings of the International Conference on Compilers, Architecture, and Synthesis for Embedded Systems, October 2010
- [SAMOS'10] *Design Space Exploration of Instruction Set Customizable MPSoCs for Multimedia Applications*. Unmesh Bordoloi, Huynh Phung Huynh, Tulika Mitra, Samarjit Chakraborty. Proceedings of the International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation, July 2010
- [DAC'10] *Instruction Cache Locking using Temporal Reuse Profile*. Yun Liang, Tulika Mitra. Proceedings of the Design Automation Conference, June 2010
- [SCOPES'10] *Modeling Shared Cache and Bus in Multi-cores for Timing Analysis*. Sudipta Chattopadhyay, Abhik Roychoudhury, Tulika Mitra. Proceedings of the International Workshop on Software and Compilers for Embedded Systems, June 2010
- [RTSS'09] *Timing Analysis of Concurrent Programs running on Shared Cache Multi-cores*. Yan Li, Vivy Suhendra, Yun Liang, Tulika Mitra and Abhik Roychoudhury. Proceedings of the Real-time System Symposium, December 2009
- [ICCAD'09] *A Hybrid Local-Global Approach for Multi-Core Thermal Management*. Ramkumar Jayaseelan, Tulika Mitra. Proceedings of the International Conference on Computer-aided Design, November 2009
- [EMSOFT'09] *Probabilistic Modeling of Data Cache Behavior*. Vinayak Puranik, Tulika Mitra, Y. N. Srikant. Proceedings of the International Conference on Embedded Software, October 2009
- [DES-Jnl'09] *Cache-aware Optimization of BAN Applications*. Lei Ju, Yun Liang, Samarjit Chakraborty, Tulika Mitra, Abhik Roychoudhury Springer Journal of Design Automation for Embedded Systems, 13(3), September 2009, pages 159–178. [**Invited paper for special issue on Best Papers from ESWeek 2008**]
- [LPE-Jnl'09] *Temperature Aware Scheduling for Embedded Processors*. Ramkumar Jayaseelan, Tulika Mitra. Journal of Low Power Electronics, American Scientific Publisher, 5(3), October 2009 [**Invited paper for special issue on VLSI Design 2009**]
- [DAC'09] *Generating Test Programs to Cover Pipeline Interactions*. Thanh Nga Dang, Abhik Roychoudhury, Tulika Mitra, Prabhat Mishra. Proceedings of the Design Automation Conference, July 2009 [**Best Paper Candidate**]
- [DAC'09] *Dynamic Thermal Management via Architectural Adaptation*. Ramkumar Jayaseelan, Tulika Mitra. Proceedings of the Design Automation Conference, July 2009
- [DAC'09] *Evaluating Design Trade-offs in Customizable Processors*. Unmesh D. Bordoloi, Huynh Phung Huynh, Samarjit Chakraborty, Tulika Mitra. Proceedings of the Design Automation Conference, July 2009
- [DAC'09] *A DVS-based Pipelined Reconfigurable Instruction Memory*. Zhiguo Ge, Tulika Mitra, Weng-Fai Wong. Proceedings of the Design Automation Conference, July 2009
- [SAMOS'09] *Runtime Adaptive Extensible Embedded Processors A Survey*. Huynh Phung Huynh, Tulika Mitra. Proceedings of the International Workshop on Systems, Architectures, Modeling, and Simulation, July 2009 [**Invited paper**]
- [DES-Jnl'09] *An Efficient Framework for Dynamic Reconfiguration of Instruction-Set Customization*. Huynh Phung Huynh, Edward Sim, Tulika Mitra. Springer Journal of Design Automation for Embedded Systems, 13(1-2), pages 91–113, June 2009 [**Invited paper for special issue on best papers from CASES 2007**]
- [DATE'09] *Runtime Reconfiguration of Custom Instructions for Real-Time Embedded Systems*. Huynh Phung Huynh, Tulika Mitra. Proceedings of the Design Automation and Test in Europe conference, April 2009

- **[RTS-Jnl'09]** *Cache-Aware Timing Analysis of Streaming Applications*. Samarjit Chakraborty, Tulika Mitra, Abhik Roychoudhury, Lothar Thiele. Real-Time Systems Journal, Kluwer Academic Publishers, 41(1), pages 52–85, January 2009. **[Invited paper for special issue on best papers from ECRTS 2007]**
- **[VLSI'09]** *Temperature Aware Scheduling for Embedded Processors*. Ramkumar Jayaseelan, Tulika Mitra. Proceedings of the IEEE International Conference on VLSI Design, pages 541–546, January 2009
- **[FPT'08]** *Defining Neighborhood Relations for Fast Spatial-Temporal Partitioning of Applications on Reconfigurable Architectures*. Edward Sim, Tulika Mitra, Weng-Fai Wong. Proceedings of the IEEE International Conference on Field Programmable Technology, pages 121–128, December 2008
- **[FPT'08]** *Processor Customization for Wearable Bio-monitoring Platforms*. Huynh Phung Huynh, Tulika Mitra. Proceedings of the IEEE International Conference on Field Programmable Technology, pages 249–252, December 2008
- **[ICCAD'08]** *Temperature aware Task Sequencing and Voltage Scaling*. Ramkumar Jayaseelan, Tulika Mitra. Proceedings of the IEEE/ACM International Conference on Computer-aided Design, pages 618–623, November 2008
- **[CODES+ISSS'08]** *Cache-aware Optimization of BAN Applications*. Yun Liang, Lei Ju, Samarjit Chakraborty, Tulika Mitra, Abhik Roychoudhury. Proceedings of the ACM International Conference on Hardware/Software Codesign and System Synthesis, pages 149–154, October 2008 **[Best paper candidate.]**
- **[CODES+ISSS'08]** *Static Analysis for Fast and Accurate Design Space Exploration of Caches*. Yun Liang, Tulika Mitra. Proceedings of the ACM International Conference on Hardware/Software Codesign and System Synthesis, pages 103–108, October 2008
- **[CODES+ISSS'08]** *Scratchpad Allocation for Concurrent Embedded Software*. Vivy Suhendra, Abhik Roychoudhury, Tulika Mitra. Proceedings of the ACM International Conference on Hardware/Software Codesign and System Synthesis, pages 37–42, October 2008
- **[DAC'08]** *Exploring Locking & Partitioning for Predictable Shared Caches on Multi-Cores*. Vivy Suhendra, Tulika Mitra. Proceedings of the 45th ACM/IEEE Design Automation Conference, pages 300–303, June 2008 **[Best presentation award.]**
- **[DAC'08]** *Cache Modeling in Probabilistic Execution Time Analysis*. Yun Liang, Tulika Mitra. Proceedings of the 45th ACM/IEEE Design Automation Conference, pages 319–324, June 2008
- **[BSN'08]** *Fast and Accurate Simulation of Biomonitoring Applications on a Wireless Body Area Network*. Kathy Dang Nguyen, Ioana Cutcutache, Saravanan Sinnadurai, Shanshan Liu, Cihat Basol, Edward Sim, Phan Thi Xuan Linh, Tok Teck Bok, Lin Xu, Francis Tay Eng Hock, Tulika Mitra, Weng-Fai Wong. Proceedings of the 5th International Workshop on Wearable and Implantable Body Sensor Networks, pages 145–148, June 2008
- **[TECS-Jnl'08]** *The Worst-Case Execution Time Problem — Overview of Methods and Survey of Tools*. R. Wilhelm, J. Engblom, A. Ermedahl, N. Holsti, S. Thesing, D. Whalley, G. Bernat, C. Ferdinand, R. Heckmann, T. Mitra, F. Mueller, I. Puaut, J. Staschulat, P. Stenström. ACM Transactions on Embedded Computing Systems, 7(3), pages 36–53, April 2008.
- **[Book Chapter]** *Worst-Case Execution Time and Energy Analysis*. Tulika Mitra, Abhik Roychoudhury. Book Chapter in The Compiler Design Handbook: Optimizations and Machine Code Generation, 2nd edition, CRC Press, 2007. Y. N. Srikant and Priti Shankar Editors. **[Invited book chapter.]**
- **[SCP-Jnl'07]** *Chronos: A Timing Analyzer for Embedded Software*. Xianfeng Li, Yun Liang, Tulika Mitra, Abhik Roychoudhury. Science of Computer Programming, special issue on Experimental Software and Toolkit, 69(1–3), pages 56–67, December 2007.

- [SMDS'07] *A SystemC-based Fast Simulator for Biomonitoring Applications on Wireless Ban.* K. D. Nguyen, I. Cutcutache, S. Sinnadurai, L. Shanshan, C. Basol, A. Curic, T. T. Bok, L. Xu, F. Tay, T. Mitra. Proceedings of the Workshop on Software and Systems for Medical Devices and Services, December 2007
- [CASES'07] *An Efficient Framework for Dynamic Reconfiguration of Instruction-Set Customization.* Huynh Phung Huynh, Edward Sim, Tulika Mitra. Proceedings of the 7th ACM/IEEE International Conference on Compilers, Architecture, and Synthesis for Embedded Systems, pages 135–144, October 2007 [**Best paper candidate.**]
- [FPL'07] *Disjoint Pattern Enumeration for Custom Instructions Identification.* Pan Yu, Tulika Mitra. Proceedings of the 17th IEEE International Conference on Field Programmable Logic and Applications, pages 273–278, August 2007 [**Best paper candidate.**]
- [ECRTS'07] *Cache-Aware Timing Analysis of Streaming Applications.* Samarjit Chakraborty, Tulika Mitra, Abhik Roychoudhury, Lothar Thiele, Unmesh D. Bordoloi, Cem Derdiyok. Proceedings of the 19th Euromicro Conference on Real-Time Systems, pages 159–168, July 2007 [**Best paper candidate.**]
- [WCET'07] *Timing Analysis of Body Area Network Application.* Yun Liang, Abhik Roychoudhury, Tulika Mitra. Proceedings of the 7th International Workshop on Worst-Case Execution Time Analysis, July 2007
- [DATE'07] *Instruction-Set Customization for Real-Time Systems.* Huynh Phung Huynh, Tulika Mitra. Proceedings of the 10th Design Automation and Test in Europe Conference and Exhibition, pages 1472–1477, April 2007
- [ASP-DAC'07] *A Retargetable Software Timing Analyzer Using Architecture Description Language.* Xianfeng Li, Abhik Roychoudhury, Tulika Mitra, Prabhat Mishra, Xu Cheng. Proceedings of the 12th Asia and South Pacific Design Automation Conference, pages 396–401, January 2007
- [RTS-Jnl'06] *Modeling Out-of-Order Processors for WCET Analysis.* Xianfeng Li, Abhik Roychoudhury, Tulika Mitra. Real-Time Systems Journal, Kluwer Academic Publishers, 34(3), pages 195–227, November 2006.
- [CASES'06] *Integrated Scratchpad Memory Optimization and Task Scheduling for MPSoC Architectures.* Vivy Suhendra, Chandrashekar Raghavan, Tulika Mitra. Proceedings of the 6th ACM/IEEE International Conference on Compilers, Architecture, and Synthesis for Embedded Systems, pages 401–410, October 2006
- [DAC'06] *Efficient Detection and Exploitation of Infeasible Paths for Software Timing Analysis.* Vivy Suhendra, Tulika Mitra, Abhik Roychoudhury, Ting Chen. Proceedings of the 43rd ACM/IEEE Design Automation Conference, pages 358–363, July 2006
- [DAC'06] *Exploiting Forwarding to Improve Data Bandwidth of Instruction-Set Extensions.* Ramkumar Jayaseelan, Haibin Liu, Tulika Mitra. Proceedings of the 43rd ACM/IEEE Design Automation Conference, pages 43–48, July 2006
- [RTAS'06] *Estimating the Worst-Case Energy Consumption of Embedded Software.* Ramkumar Jayaseelan, Tulika Mitra, Xianfeng Li. Proceedings of the 12th IEEE Real-Time and Embedded Technology and Applications Symposium, pages 81–90, April 2006
- [VLSI'06] *Handling Constraints in Multi-objective GA for Embedded System Design.* Biman Chakraborty, Ting Chen, Tulika Mitra, Abhik Roychoudhury. Proceedings of the 19th IEEE International Conference on VLSI Design, pages 305–310, January 2006
- [RTSS'05] *WCET Centric Data Allocation to Scratchpad Memory.* Vivy Suhendra, Tulika Mitra, Abhik Roychoudhury, Ting Chen. Proceedings of the 26th IEEE Real-time Systems Symposium, pages 223–232, December 2005
- [ICDCIT'05] *Analyzing Loop Paths for Execution Time Estimation.* Abhik Roychoudhury, Tulika Mitra, Hemendra Singh Negi. Proceedings of the 2nd International Conference on Distributed Computing and Internet Technology, pages 458–469, December 2005. LNCS vol. 3347

- [CODES+ISSS'05] *Satisfying Real-Time Constraints with Custom Instructions*. Pan Yu, Tulika Mitra. Proceedings of the ACM International Conference on Hardware/Software Codesign and System Synthesis, pages 166–171, September 2005
- [WCET'05] *Exploiting Branch Constraints without Exhaustive Path Enumeration*. Ting Chen, Tulika Mitra, Abhik Roychoudhury, Vivy Suhendra. Proceedings of the 5th International Workshop on Worst-Case Execution Time Analysis, July 2005.
- [RTS-Jnl'05] *Modeling Control Speculation for Timing Analysis*. Xianfeng Li, Tulika Mitra, Abhik Roychoudhury. Real-Time Systems Journal, Kluwer Academic Publishers, 29(1), pages 27–58, January 2005.
- [RTSS'04] *Modeling Out-of-Order Processors for Software Timing Analysis*. Xianfeng Li, Abhik Roychoudhury, Tulika Mitra. Proceedings of the IEEE Real-time Systems Symposium, pages 92–103, December 2004
- [ICCAD'04] *Configuration Bitstream Compression for Dynamically Reconfigurable FPGAs*. Ju Hwa Pan, Tulika Mitra, Weng-Fai Wong. Proceedings of the 22nd IEEE/ACM International Conference on Computer Aided Design, pages 766–773, November 2004
- [PACT'04] *Impact of Java Memory Model on Out-of-Order Multiprocessors*. Tulika Mitra, Abhik Roychoudhury, Qinghua Shen. Proceedings of the 13th IEEE/ACM International Conference on Parallel Architecture and Compilation Techniques, pages 99–110, September-October 2004
- [CASES'04] *Scalable Custom Instructions Identification for Instruction-Set Extensible Processors*. Pan Yu, Tulika Mitra. Proceedings of the 4th ACM/IEEE International Conference on Compilers, Architecture, and Synthesis for Embedded Systems, pages 69–78, September 2004 [**Best paper candidate.**]
- [DAC'04] *Characterizing Embedded Applications for Instruction-Set Extensible Processors*. Pan Yu, Tulika Mitra. Proceedings of the 41st ACM/IEEE Design Automation Conference, pages 723–728, June 2004
- [ICS'04] *Design Space Exploration of Caches using Compressed Traces*. Xianfeng Li, Hemendra Singh Negi, Tulika Mitra, Abhik Roychoudhury. Proceedings of the 18th Annual ACM International Conference on Supercomputing, pages 116–125, June 2004
- [WCET'04] *Simplifying WCET Analysis by Code Transformations*. Hemendra Singh Negi, Abhik Roychoudhury, Tulika Mitra. Proceedings of the 4th International Workshop on Worst-Case Execution Time Analysis, June 2004.
- [CAD/Graphics'04] *Improving Rendering by Texture Map-Based Triangle Strips*. Yu Yang, Tulika Mitra, Zhiyong Huang. Journal of Computer Aided Design & Computer Graphics, Science Press, 16(6), pages 740–746, June 2004. Also appears in the Proceedings of the 8th International Conference on Computer Aided Design and Computer Graphics (CAD/Graphics), October 2003.
- [CODES+ISSS'03] *Accurate Estimation of Cache-Related Preemption Delay*. Hemendra Singh Negi, Tulika Mitra, Abhik Roychoudhury. Proceedings of the ACM International Conference on Hardware/Software Codesign and System Synthesis, pages 201–206, October 2003
- [FPL'03] *A Model for Hardware Realization of Kernel Loops*. Jirong Liao, Weng-Fai Wong, Tulika Mitra. Proceedings of the 13th International Conference on Field Programmable Logic and Applications, pages 334–344, September 2003
- [DAC'03] *Accurate Timing Analysis by Modeling Caches, Speculation and their Interaction*. Xianfeng Li, Tulika Mitra, Abhik Roychoudhury. Proceedings of the 40th ACM/IEEE Design Automation Conference, pages 466–471, June 2003
- [PPoPP'03] *Compactly Representing Parallel Program Executions*. Ankit Goel, Abhik Roychoudhury, Tulika Mitra. Proceedings of the 9th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, pages 191–202, June 2003

- [DATE'03] *Using Formal Techniques to Debug the AMBA System-on-Chip Bus Protocol*. Abhik Roychoudhury, Tulika Mitra, Siddhartha Rao Karri. Proceedings of the 6th Design Automation and Test in Europe Conference and Exhibition, pages 10828–10833, March 2003
- [DCC'03] *Compression-Domain Editing of 3D Models*. Tulika Mitra, Tzi-cker Chiueh. Proceedings of the 13th IEEE Data Compression Conference, pages 343–352, March 2003.
- [FPT'02] *A Co-simulation Study of Adaptive EPIC Computing*. Valentin Stefan Gheorghita, Weng-Fai Wong, Tulika Mitra, Surendranath Talla. Proceedings of the 1st IEEE International Conference on Field Programmable Technology, pages 268–275, December 2002
- [ISSS'02] *Timing Analysis of Embedded Software for Speculative Processors*. Tulika Mitra, Abhik Roychoudhury, Xianfeng Li. Proceedings of the 15th ACM/IEEE International Symposium on System Synthesis, pages 126–131, October 2002
- [WCET'02] *A Framework to Model Branch Prediction for WCET Analysis*. Tulika Mitra, Abhik Roychoudhury. Proceedings of the 2nd Workshop on Worst Case Execution Time Analysis, June 2002
- [USENIX'02] *A Decoupled Architecture for Application-Specific File Prefetching*. Chuan-Kai Yang, Tulika Mitra, Tzi-cker Chiueh. Proceedings of the USENIX Annual Technical Conference, FREENIX track, pages 157–170, June 2002.
- [ICSE'02] *Specifying Multithreaded Java Semantics for Program Verification*. Abhik Roychoudhury, Tulika Mitra. Proceedings of the 22nd ACM/IEEE International Conference on Software Engineering, pages 489–499, May 2002
- [FCCM'02] *An FPGA Implementation of Triangle Mesh Decompression*. Tulika Mitra, Tzi-cker Chiueh. Proceedings of the 10th IEEE International Symposium on Field Programmable Custom Computing Machines, pages 22–34, April 2002
- [IPDPS'02] *Compression Domain Parallel Rendering*. Tulika Mitra, Tzi-cker Chiueh. Proceedings of the 16th IEEE/ACM International Parallel and Distributed Processing Symposium, pages 1–8, April 2002 (98/258 = 38% acceptance)
- [MMS-Jnl'00] *Zodiac: A History-Based Interactive Video Authoring System*. Tzi-cker Chiueh, Tulika Mitra, Anindya Neogi, Chuan-Kai Yang. ACM/Springer-Verlag Multimedia Systems Journal, special issue on Multimedia Authoring and Presentation Techniques, 8(3), pages 201–211, October 2000.
- [VIS'00] *On-the-Fly Rendering of Losslessly Compressed Irregular Volume Data*. Chuan-Kai Yang, Tulika Mitra, Tzi-cker Chiueh. Proceedings of the 11th Annual IEEE Visualization Conference, pages 101–108, October 2000
- [ICME'00] *Application-Specific File Prefetching for Multimedia Programs*. Tulika Mitra, Chuan-Kai Yang, Tzi-cker Chiueh. Proceedings of the IEEE International Conference on Multimedia and Expo, pages 459–462, July 2000.
- [CS'00] *Three Dimensional Graphics Architecture*. Tulika Mitra, Tzi-cker Chiueh. Current Science: Special Section on Computational Science, 78(7), pages 101–109, April 2000.
- [TCCA'00] *Reusing BIST Logic for Intelligent DRAM*. Tzi-cker Chiueh, Tulika Mitra. IEEE Computer Society Technical Committee on Computer Architecture (TCCA) Newsletter, Spring 2000.
- [MICRO'99] *Dynamic 3D Graphics Workload Characterization and the Architectural Implications*. Tulika Mitra, Tzi-cker Chiueh. Proceedings of the 32nd ACM/IEEE International Symposium on Microarchitecture, November 1999, pages 62–71
- [ISCA'99] *Dynamic Vectorization: A Mechanism for Exploiting Far-Flung ILP in Ordinary Programs*. Sriram Vajapeyam, P.J. Joseph, Tulika Mitra. Proceedings of the 26th ACM/IEEE Annual International Symposium on Computer Architecture, May 1999, Pages 16–27
- [ICPADS'98] *Implementation and Performance Evaluation of Parallel Mesa Library*. Tulika Mitra, Tzi-cker Chiueh. Proceedings of the IEEE International Conference on Parallel and Distributed Systems, pages 84–91, December 1998.

- [ACMMM'98] *Zodiac: A History-Based Interactive Video Authoring System*. Tzi-cker Chiueh, Tulika Mitra, Anindya Neogi, Chuan-Kai Yang. Proceedings of the 6th ACM International Multimedia Conference, pages 435–444, September 1998.
- [GH'98] *A Breadth-First Approach to Efficient Mesh Traversal*. Tulika Mitra, Tzi-cker Chiueh. Proceedings of the 13th ACM SIGGRAPH/Eurographics Workshop on Graphics Hardware, pages 31–38, August 1998.
- [ISCA'97] *Improving Superscalar Instruction Dispatch and Issue by Exploiting Dynamic Code Sequence*. Sriram Vajapeyam, Tulika Mitra. Proceedings of the 24th ACM/IEEE International Symposium on Computer Architecture, June 1997, Pages 1-12

Thesis, Reports, and Others

- *Adaptive Isolation for Predictability and Security*. Tulika Mitra, Jrgen Teich, Lothar Thiele. Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik. Dagstuhl Reports, 6(10), 2016
- *Challenges in Designing Embedded Systems Courses*. Tulika Mitra. Proceedings of the 2nd Workshop on Embedded Systems Education (WESE) held in conjunction with ACM/IEEE Conference on Embedded Software (EMSOFT), October 2006.
- *Mesh Compression and Its Hardware/Software Applications*. Tulika Mitra. PhD Thesis, Department of Computer Science, State University of New York at Stony Brook, December 2000.
- *Dynamic Random Access Memory: A Survey*. Tulika Mitra. Technical Report. Department of Computer Science, State University of New York at Stony Brook, March 1999.
- *Performance Evaluation of Improved Superscalar Issue Mechanisms*. Tulika Mitra. Masters Thesis, Department of Computer Science and Automation, Indian Institute of Science, Bangalore, India, January 1997.
- *A neural method for determining electromagnetic shower positions in laterally segmented calorimeters*. Amitava Roy, Amlan Roy, Tulika Mitra, Arunabha Roy. Nuclear instruments and methods in Physics Research Section A, 364(3), pages 524–530, October 1995.

SOFTWARE RELEASE

- **Chronos: A Timing Analyzer for Embedded Software 2006**
Chronos is an open-source software that estimates, through static analysis, the worst-case execution time (WCET) of a program on a specific hardware platform. WCET of a task is an essential input to the schedulability analysis of hard real-time systems. Chronos was invited and successfully participated in the WCET Tool Challenge 2006 organized by ARTIST2 Network of Excellence of the EU on Embedded Systems Design. Chronos version 2.0 is currently being used by 100 different universities, institutes, and industrial labs in Asia, Europe, and USA.
URL: www.comp.nus.edu.sg/~rpembed/chronos/
- **PMESA: A Parallel Implementation of Mesa 1998**
PMESA is a parallel version of the Mesa 3D graphics library (an open-source software implementation of OpenGL). It is a library that can be called by parallel (or non-parallel) surface-creation programs to render the surfaces they create. Example usages of this library include isosurface extraction and unstructured grid visualization while running on Intel Paragon, Sandia National Lab's teraflop supercomputer (ASCI Red), and commodity-based massively parallel computing system (Computational Plant).

GRADUATE STUDENT SUPERVISION

Post-doctoral Fellows

1. K Raghavendra, PhD IIT Madras 2017

2. Gayathri Ananthanarayanan, PhD IIT Delhi 2017
3. Alok Prakash, PhD Nanyang Technological University 2013
4. Thomas Marconi, PhD Delft University of Technology 2010

PhD students

1. Li Xianfeng: “Microarchitecture modeling for Timing Analysis of Embedded Software”, 2005. (Joint supervision with Abhik Roychoudhury)
Winner: Dean’s graduate award 2003; IDA/Dell Fellowship 2003
Employment: Professor, Peking University
2. Pan Yu: “Automatic Software/Hardware Partitioning for Instruction-Set Extensible Processors”, 2008.
Winner: Dean’s graduate award 2004; SUN Fellowship 2005
Employment: Senior Scientist at nuTonomy
3. Vivy Suhendra: “Memory Optimizations for Time-Predictable Embedded Software”, 2009 (Joint supervision with Abhik Roychoudhury)
Winner: Microsoft Research Asia Fellowship Award 2006
Employment: Executive Director, Singapore Cybersecurity Consortium
4. Huynh Phung Huynh: “Instruction Set Customization for Multiple-Processor SoC Design”, 2009
Employment: Scientist and Capability Group Manager, Institute of High Performance Computing (IHPC) Singapore
5. Ramkumar Jayaseelan: “Application-Specific Thermal Management of Computer Systems”, 2010
Winner: President’s Graduate Fellowship 2007
Employment: NVIDIA, Austin, Texas
6. Liang Yun: “Instruction Cache Optimizations for Embedded Systems”, 2010
Winner: Deans Graduate Research Excellence Award 2010, Research Achievement Award 2009
Employment: Assistant Professor, Peking University
7. Ding Huping “Instruction Cache Optimizations in Embedded Real-Time Systems”, 2014
Winner: Research Achievement Award 2012
Employment: Alibaba AI Labs
8. Mihai Pricopi “A Dynamic Heterogeneous Multi-Core Architecture”, 2014
Winner: Best Student Poster Award, 7th International Conference on High-Performance and Embedded Architectures and Compiler, 2012, Research Achievement Award 2012
Employment: ARM Cambridge UK
9. Thannirmalai Somu Muthukaruppan “Efficient Power Management for Heterogeneous Multi-Core Systems”, 2014
Winner: Research Achievement Award 2013
Employment: Intel
10. Chen Liang “Design and Compilation Techniques for Configurable Accelerators”, 2014
Winner: Best Paper Award FPT 2012, Research Achievement Award 2011 Employment: Quantitative Strategist, Tower Research Capital
11. Zhong Guanwen “Compilation Techniques for Heterogeneous MPSoCs”, 2017
Winner: Research Achievement Award 2016 Employment: Xilinx Research Labs
12. Tan Cheng “Universal System-on-chip Design”, expected 2017
13. Siqi Wang “Coordinated CPU-GPU Power Management”, expected 2018
14. V Vanchinathan “Transformer Core Architecture”, expected 2019
15. Manupa Karunarathne “Application Mapping on Accelerators”, expected 2019 Winner: Presidents Graduate Fellowship 2017, Research Achievement Award 2017

16. Guanhua Wang “Software Support for Trusted Execution Environment”, expected 2020
17. Nishant Shyamal Budhdev “Energy-Efficient 5G Processing”, expected 2020
18. Arka Maity “Runtime Management of Many-Core Architectures”, expected 2021

Masters students

1. Raman Balaji: “Efficient Design Space Exploration of Processors”, 2003. Employment: Post-doctoral Research Scientist, Verimag, France.
2. Liao Jirong: “Mapping Computation Kernels to FPGA”, 2003 (Joint supervision with Weng-Fai Wong). Employment: Citibank, PRC.
3. Shen Qinghua: “Multithreaded Java from Multiprocessor perspective”, 2004 (Joint supervision with Abhik Roychoudhury). Employment: Creative Technology Singapore.
4. Hemendra Singh Negi: “Two Concrete Problems in Timing Analysis of Embedded Real-Time Software”, 2004 (Joint supervision with Abhik Roychoudhury). Employment: Member of consulting staff, Cadence Design Systems, India
5. Li Yan: “Timing Analysis of Embedded Software on Multi-Core Platforms”, 2010. Employment: Graduate student, Washington University in St. Louis, USA
6. Kaushik Mysur “On Demand Asymmetric Multi-Cores”, 2012. Employment: Research Lead, Hitachi Asia, Singapore.
7. Jiao Qing “Improving GPGPU Energy-Efficiency through Concurrent Kernel Execution and DVFS”, 2015.

INVITED PRESENTATIONS AT SCIENTIFIC MEETINGS

- “Mobile Heterogeneous Computing: A Software Perspective”, Keynote Address at 15th IEEE/ACM Symposium on Embedded Systems for Real-Time Multimedia (ESTIMedia) 2017
- “Behind the Scenes of The Internet of Things Revolution”, Popular Talk Series at Indian Institute of Science (IISc) 2017
- “Accelerators for Smart IoT Devices”, Future Chips Forum on “Smart Chips for Future Smart World at Tshinghua University 2017
- “Improving Energy-Efficiency through Heterogeneity in Mobile Platforms”, Dagstuhl Seminar on “Dark Silicon: From Embedded to HPC Systems”, 2016
- “Software Development for Isolation”, Dagstuhl Seminar on “Adaptive Isolation for Predictability and Security” 2016
- “Embracing On-chip Heterogeneity”, Perspective Talk at Future Chips Forum, Tshinghua University 2016
- “Coordinated Power Management for Heterogeneous Multi-core Architectures”, ICCAD 2014 Workshop on “A Roadmap for EDA Research in the Dark Silicon Era”
- “Runtime Management of Heterogeneous Multi-cores”, Special Session on “Dark Silicon as a Challenge for Hardware/Software Co-Design”, CODES+ISSS at Embedded Systems Week 2014
- “Energy-Efficient Computing with Heterogeneous Multi-cores”, ISIC 2014 special session on “Energy Efficiency, Complexity, and High-Level Design Methodologies”
- “Power Management of Asymmetric Multi-Cores in High-Performance Mobile Platforms”, Samsung-SNU joint workshop on Power and Thermal Management for Mobile Systems, South Korea, 2013
- “Adaptive Asymmetric Multi-Core for Energy-Efficient High-Performance Computing”, Advanced Computing and Communications Society Workshop on Adaptive Computing: The Role of Big Data, India, 2013

- “Thermal Reliability Aware Scheduling and Power Management for Heterogeneous Multi-cores”, Workshop on Compiler Assisted SoC Assembly held in conjunction with Embedded Systems Week (ESWeek), Canada 2013 (presented by PhD student Mihai Pricopi)
- “A Polymorphic Heterogeneous Multi-Core System”, Workshop on Compiler Assisted SoC Assembly held in conjunction with Embedded Systems Week (ESWeek), Taiwan 2011
- “Adaptive Computing for Embedded Systems”, Plenary Speaker. International Congress on Computer Applications and Computational Science (CACCS), Singapore 2010
- “Design Space Exploration of Application-Specific Processors”, Workshop on Rapid Simulation and Performance Evaluation: Methods and Tools, held in conjunction with the International Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC), Italy 2010
- “Designing Memory Hierarchy with Timing Predictability”, Workshop on SoC Design Methodologies, Taiwan 2008
- “Processor Customization for Real-Time Systems”, Workshop on Compiler Assisted SoC Assembly held in conjunction with Embedded Systems Week (ESWeek), Austria 2007
- “A Compilation Framework for Runtime Customizable Processors”, Workshop on SoC Design Methodologies, South Korea 2007
- “Processor Customization”, Workshop on System Level Design and Modelling, organized by IIT Delhi and Naval Research Board, India 2007
- “Design Methodologies for Customizable Embedded Processors”, UK-Singapore Microelectronics and Embedded Systems Workshop, Singapore 2007
- “Compile-time Design Space Exploration for Dynamically Reconfigurable System-on-a-Chip”, Optimizing Compiler Assisted SoC Assembly Workshop, USA 2005 (with Weng-Fai Wong)

INVITED PRESENTATIONS AT ORGANIZATIONS

- ARM, AMD, Intel, TI, Huawei, Samsung, Tsinghua University, Peking University, Zhejiang University, Indian Institute of Science, IIT Delhi, IIT Madras, Technical University of Munich, Karlsruhe Institute of Technology, Friedrich-Alexander-Universitt Erlangen-Nuremberg, Politecnico di Milano, Nanyang Technological University, Princeton University.

PROFESSIONAL SERVICE

Editorial Board

- Deputy Editor-in-Chief, IEEE Embedded Systems Letters (ESL), 2016–2018
- Senior Associate Editor, ACM Transactions in Embedded Computing Systems (TECS), 2014 –
- Associate Editor, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 2014 –
- Associate Editor, IEEE Design and Test (IEEE D&T), 2016 –
- Associate Editor, IET Computers and Digital Techniques, 2012 –
- Associate Editor, EURASIP Journal on Embedded Systems, 2010 –
- Associate Editor, IEEE Embedded Systems Letters, 2009–2011
- Guest Editor, IEEE Design and Test Special Issue on Time-Critical Systems Design 2017
- Section Editor, Springer Handbook of Hardware/Software Codesign 2015–2016

- Guest Editor, ACM Transactions in Embedded Computing Systems Special Issue on Application Specific Processors 2011
- Guest Editor, Special Issue on Integrated Designs for Embedded Systems, EURASIP Journal on Embedded Systems 2009

Organizing Committee Member

- Steering Committee, ACM/IEEE International Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES) 2017 –
- Steering Committee, ACM/IEEE International Conference on Embedded Software (EMSOFT) 2014 –
- Steering Committee, IEEE International Conference on Field-Programmable Technology (FPT) 2012 –
- Workshop chair, Embedded Systems Week, 2015–2016
- Program chair, ACM/IEEE International Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES) 2018
- Track chair, CPS/HW-SW Integration/IoT Track, 39th IEEE Real-Time Systems Symposium (RTSS) 2018
- Subcommittee chair, SoC, Heterogeneous, and Accelerator Architectures, IEEE/ACM Design Automation Conference (DAC) 2018
- Program co-chair, ACM/IEEE International Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES) 2017
- Subcommittee chair, New and Emerging System-level and Architecture Designs, IEEE/ACM Design Automation Conference (DAC) 2017
- Organizer, Dagstuhl Seminar, Adaptive Isolation for Predictability and Security, 2016
- Topic chair, Compilers and Software Synthesis for Embedded Systems, Design Automation and Test in Europe (DATE) 2016
- Track chair, Embedded Systems Design for Real-Time Applications, 21st IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) 2015
- Program chair, 14th ACM International Conference on Embedded Software (EMSOFT) 2014
- Technical Program Vice Co-chair, Asia-Pacific Design Automation Conference (ASPDAC) 2014
- Subcommittee chair, Embedded System Design, IEEE/ACM Design Automation Conference (DAC) 2012 – 2014
- Topic chair/co-chair, Architecture and Micro-architecture, Design Automation and Test in Europe (DATE) 2012 – 2014
- General co-chair, IEEE International Conference on Field-Programmable Technology (FPT) 2011
- General co-chair, IEEE Symposium on Application Specific Processors (SASP) 2010
- Program co-chair, IEEE Symposium on Application Specific Processors (SASP) 2009
- Track co-chair, IEEE International Conference on VLSI Design (VLSI) 2009, 2014
- Publications chair, IEEE Symposium on Application Specific Processors (SASP) 2008
- Organizing committee, Microelectronics and Embedded systems Workshop (MES) 2007
- Publicity chair, Embedded Systems Week 2013
- Publicity chair, IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA) 2007

- Publicity chair, Asia-Pacific Computer Systems Architecture Conference (ACSAC) 2005

International Research Agencies and Organizations

- Member, INRIA Evaluation Panel 2016
- Member, Computer Science Panel of Swedish Research Council 2012, 2014
- Expert Reviewer, Swiss National Science Foundation
- Expert Reviewer, Austrian Science Fund
- Expert Reviewer, French National Research Agency
- Expert Reviewer, Research Grants Council (RGC) of Hong Kong
- Expert Reviewer, TUM-IAS Hans Fischer Senior Fellowship

Program Committee Member

- ICCAD Ten Year Retrospective Most Influential Paper Award Committee, 2015–2017
- IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) Best Paper Selection Committee, 2017
- ACM/IEEE Design Automation Conference (DAC) Best Paper Selection Committee, 2017
- ACM Transactions on Design Automation of Electronic Systems (TODAES) Best Paper Selection Committee, 2016
- IEEE/ACM Design Automation Conference (DAC) 2011 – 2014, 2017-18
- IEEE/ACM International Conference on Computer-Aided Design (ICCAD) 2011 – 2013
- Design Automation and Test in Europe (DATE) 2010 – 2016
- Asia South Pacific Design Automation Conference (ASP-DAC) 2005, 2008–2010, 2015
- International Conference on Embedded Software (EMSOFT) 2010, 2014-2016
- ACM International Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES) 2007, 2009 – 2013, 2016–2018
- ACM Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES) 2011, 2013, 2015–2016
- ACM/IEEE International Symposium on Microarchitecture (MICRO) 2016
- IEEE International Conference on Computer Design (ICCD) 2005, 2014–2015
- IEEE International Symposium on Low Power Electronics and Design (ISLPED) 2015
- IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) 2015
- IEEE Real-Time Systems Symposium (RTSS) 2015 – 2016
- IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA) 2016
- IEEE International Conference on Field-Programmable Technology (FPT) 2002, 2004–2018
- IEEE International Conference on Field Programmable Logic and Applications (FPL) 2007–2015
- IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP) 2007–2012
- IEEE Symposium on Application Specific Processors (SASP) 2007–2011

- ACM International Conference on Computing Frontiers (CF) 2013
- Annual Conference on Parallel Processing (ICPP) 2011 – 2014
- International Conference on Compiler Construction (CC) 2015
- International Conference on ReConFigurable Computing and FPGAs (ReConFig) 2008 – 2012
- IEEE International Conference on VLSI Design (VLSI) 2005, 2009-2012, 2014
- IEEE International Conference of Very Large Scale Integration (VLSI-SoC) 2013
- IEEE International Symposium on VLSI (ISVLSI) 2011
- International Workshop on Worst-Case Execution Time Analysis(WCET) 2005, 2008–2009, 2013–2014
- International Conference on Embedded Computer Systems: Architectures, Modeling, and Simulation (SAMOS) 2013
- International Conference on Embedded Software and Systems (ICCESS) 2005
- International Workshop on Embedded Single and Multicore Systems on Chips (MCSoc) 2006–2007
- Asia-Pacific Workshop on Embedded System Education and Research (APESER) 2007–2008
- IEEE International Symposium on Embedded Computing (SEC) 2008
- International Workshop on Embedded Software Optimization (ESO) 2008-2009
- International Workshop on Reconfigurable and Streaming HPC 2009
- International Conference on Distributed Computing and Internet Technology (ICDCIT) 2011-2012

Professional Society

- Conference Committee Member, IEEE Council on Electronic Design Automation (CEDA), 2014 –
- Founding Chair, ACM Special Interest Group on Design Automation (SIGDA) Singapore Chapter, 2014

Reviewer

- Journals: IEEE Transactions on Computers, IEEE Transactions on VLSI, IEEE Transactions on CAD, ACM Transactions on Embedded Computing Systems, ACM Transactions on Reconfigurable Technology and Systems, IEEE Transactions on Multimedia, IEEE Transactions on Circuits and Systems for Video Technology, Journal of Systems and Software, Journal of VLSI Signal Processing Systems, Journal of Microprocessors and Microsystems, Journal of Real-Time Image Processing, Journal of Systems Architectures, Current Science Journal, IET Computers & Digital Techniques, Microelectronics Journal.
- Conferences: FST&TCS, DAC, EMSOFT, ICS, ECRTS, Eurographics, CODES+ISSS, SAC, IISWC, MWCAS etc.
- PhD Thesis Examination: University of New South Wales (UNSW) Australia, University of Lugano (USI) Switzerland, Royal Institute of Technology (KTH), Sweden, University of Turku Finland
- Book: McGraw-Hill Education
- Patent: Industry & Technology Relations Office (INTRO), NUS

University Services

- Deputy Head (Special Programmes), Computer Science Department, NUS 2016 –
- Member, University Promotion & Tenure Committee (UPTC) 2017 –
- Chair, Joint Academic Committee, Computer Engineering Programme 2011–2013, 2015–2017
- Computer Science Faculty Recruitment Committee 2014 –

- Coordinator for Computer Engineering, Engineering Accreditation Board Task Force 2011 – 2013
- Member, Joint Academic Committee, Computer Engineering Programme 2009–
- Member, School Curriculum Committee 2007–
- Member, Faculty Teaching Evaluation Committee 2007– 2011
- PhD QE coordinator for Computer Science systems area 2010 – 2011
- Mentor, Special Interest Group in Embedded Systems 2006–2008.
- Embedded Systems Lab Coordinator 2001
- Member, School of Computing PhD/MSc Best Thesis Selection Committee 2002–2003, 2013
- Judge, National Information Technology Awareness Programme (NITA) 2003