

CURRICULUM VITAE

Mingsong Chen

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RESEARCH INTERESTS

Cyber-Physical Systems, Formal Verification, Embedded Systems, VLSI CAD

EDUCATION

- 2006 - 2010 **Ph.D.** in Computer Science, Computer and Information Science and Engineering, University of Florida. Advisor: Prof. [Prabhat Mishra](#).
- 2003 - 2006 **M.Eng.** in Computer Applications Technology, Department of Computer Science and Technology, Nanjing University. Advisor: Prof. [Xuandong Li](#).
- 1999 - 2003 **B.S.** in Computer Science and Technology, Department of Computer Science and Technology, Nanjing University

EMPLOYMENT

- | | | |
|-------------|----------------------------|---|
| 2015 - | <i>Professor</i> | East China Normal University , Shanghai, China |
| 2010 – 2015 | <i>Associate Professor</i> | East China Normal University , Shanghai, China |
| 2007 - 2010 | <i>Research Assistant</i> | University of Florida , Gainesville. USA |
| 2006 - 2007 | <i>Teaching Assistant</i> | University of Florida , Gainesville. USA |
| Summer 2005 | <i>Intern (R&D)</i> | Trend Micro , Nanjing, China |
| 2002 - 2006 | <i>Research Assistant</i> | Nanjing University , Nanjing, China |

HONORS & CERTIFICATES

- | | |
|------------|--|
| 2013 | International Conference on VLSI Design, Best Paper Nominee |
| 2010 | Design Automation Conference Ph.D. Forum Grant |
| 2009 | DAC Summer School Travel Grant |
| 2009 | International Conference on VLSI Design, Best Paper Nominee |
| 2008 | DAC Young Student Support Program Award |
| 2007 | Achievement Award, University of Florida |
| 2005 | Outstanding Graduate Student scholarship, Nanjing University |
| 2000--2002 | People's Scholarship, Nanjing University |

PROJECTS & Funding

- 1: Intel Research Project (2018.4 - 2018.12, 0.06M RMB, PI)
- 2: Natural Science Foundation of China (2017.1-2017.12, 0.16M RMB, PI)
- 3: Key project from Ministry of Education of Shanghai (2014.01-2016-12, 1.5M RMB, PI)
- 4: Natural Science Foundation of China (2013.1-2015.12, 0.25M RMB, PI)
- 5: Innovation Prog. of Shanghai Municipal Edu. Commission (2014.1 - 2016.12, 0.16M RMB, PI)

5: Doctoral Fund of Ministry of Education of China (2012.1 - 2013.12, 0.05M RMB, PI)

TEACHING EXPERIENCE

Computer Architecture (Graduate)		Spring 2013-2018
Parallel Computing Programming (Undergraduate)		Spring 2013-2018
Introduction to Testing (Undergraduate)		Spring 2014
Introduction to Cyber-Physical Systems (Graduate)		Fall 2011-2018
Introduction to Automata Theory (Undergraduate)		Fall 2015
Introduction to JAVA Programming (Undergraduate)		Summer 2014-2018
CDA3101	<i>Computer Organization</i>	Spring 2009, Fall 2009
COP5725	<i>Database Management</i>	Fall 2008
CIS6930	<i>Embedded Systems</i>	Spring 2008
COP3530	<i>Data Structure and Algorithms,</i>	Fall 2006, Spring 2007, Summer 2007

PROFESSIONAL SKILLS

Operating System: Linux, Windows, Solaris

Programming Language: C, C++, Java, Verilog, Perl, CUDA, Assembly Language, UML, Matlab

PROFESSIONAL ACTIVITIES

Editorial Activity:

- [1] Associate Editor of Journal of Circuits, Systems and Computers (JCSC), 2013 - present
- [2] Associate Editor of IET Computers & Digital Techniques (CDT), 2016 - present

Technical Program Committee Member:

- [1] International Conference on Methods and Models for System Design (MEMOCODE), 2018.
- [2] Design Automation and Test in Europe (DATE'14-16)
- [3] International Conference on VLSI Design (VLSID'14-16, 18)
- [4] International Conference on Parallel and Distributed Systems (ICPADS'14)
- [5] ACM Symposium on Applied Computing (SAC), 2011-2018.
- [6] Microsoft Research Asia Verified Software, 2012.
- [7] Summer Simulation Multi-Conference, Simulation in the System Design Flow, 2016
- [8] International Workshop on Formal methOds for Real-time Distributed Systems (FORDS'12)
- [9] International Conference on Contemporary Computing (IC3), 2010.
- [10] International Conference on Formal Engineering Methods (ICFEM), 2010.

Reviewer:

- [1] International Conference on (CODES+ISSS), 2007, 2008, 2009, 2012
- [2] Design Automation Conference (DAC), 2009-2016
- [3] The International Conference on Computer-Aided Design (ICCAD), 2012
- [4] Design Automation & Test in Europe (DATE), 2010, 2014-2016
- [5] International Conference on VLSI Design (VLSI Design), 2007-2016
- [6] ACM Great Lakes Symposium on VLSI (GLSVLSI), 2009
- [7] IEEE Computer Society Annual Symposium on VLSI (ISVLSI), 2009
- [8] Asia and South Pacific Design Automation Conference (ASP-DAC), 2010.

- [9] ACM Transactions on Design Automation of Electronic System (TODAES)
- [10] ACM Transactions on Cyber-Physical Systems (TCPS)
- [11] IEEE Transactions on Computers (TC)
- [12] IEEE Transactions on CAD of Integrated Circuits and Systems (TCAD)
- [13] IEEE Transactions on Very Large Scale Integration Systems (TVLSI)
- [14] IEEE Transactions on Cloud Computing (TCC)
- [15] IEEE Transactions on Parallel and Distributed Systems
- [16] Journal of Electronic Testing (JETTA)
- [17] VLSI Design
- [18] IEEE Design & Test of Computers
- [19] Frontiers of Computer Science in China
- [20] Journal of Systems and Software
- [21] Journal of Circuits, Systems and Computers

PUBLICATIONS

Journal Articles

- [J25] T. Wu, H. Gu, X. Liu, J. Zhou, T. Wei, and **M.Chen**. Energy-Efficient Task Scheduling for Reliability-Aware Workflow Applications in DVFS-Enabled Cloud. To appear in Journal of Systems Architecture, 84: 12-27, 2018.
- [J24] Yangdi Lyu, Xiaoke Qin, **Mingsong Chen** and Prabhat Mishra. Directed Test Generation for Validation of Cache Coherence Protocols. To appear in IEEE Transactions on COMPUTER-AIDED DESIGN of Integrated Circuits and Systems (TCAD).
- [J23] Jie Liu, Jing Liu, Miaomiao Zhang, Haiying Sun, Xiaohong Chen, Dehui Du, **Mingsong Chen**. A proof-based method for hybrid systems development using differential invariants. To appear in Frontier of Computer Science, 2018.
- [J22] Tongquan Wei, Junlong Zhou, Kun Cao, Peijin Cong, **Mingsong Chen**, X. Sharon Hu, and Jianming Yan. Cost-Constrained QoS Optimization for Approximate Computation Real-Time Tasks in Heterogeneous MPSoC Systems. To appear in IEEE Transactions on COMPUTER-AIDED DESIGN of Integrated Circuits and Systems (TCAD).
- [J21] Junlong Zhou, Jianming Yan, Junchao Tan, Tongquan Wei, **Mingsong Chen**, and Shiyan Hu. Thermal-Aware Correlated Two-Level Scheduling of Real-Time Tasks with Reduced Processor Energy on Heterogeneous MPSoCs. To appear in Journal of Systems Architecture.
- [J20] Junlong Zhou, Kun Cao, Tongquan Wei, **Mingsong Chen**, and Yue Ma. Reliability and Temperature Constrained Task Scheduling for Makespan Minimization on Heterogeneous Multi-core Platforms. To appear in Journal of Systems and Software.
- [J19] **Mingsong Chen**, Xinqian Zhang, Haifeng Gu, Tongquan Wei and Qi Zhu. Sustainability-Oriented Evaluation and Optimization for MPSoC Task Allocation and Scheduling Under Thermal and Energy Variations. To appear in IEEE Transactions on Sustainable Computing, 2017.
- [J18] Chenhao Xie, Jingweijia Tan, **Mingsong Chen**, Yang Yi, Lu Peng, Xin Fu. Emerging technology enabled energy-efficient gpgpus register file. To appear in Journal of Microprocessors and Microsystems.
- [J17] Yongxiang Bao, **Mingsong Chen**, Qi Zhu, Tongquan Wei and Frederic Mallet. Quantitative

- Performance Evaluation of Uncertainty-Aware Hybrid AADL Designs Using Statistical Model Checking. To appear in IEEE Transactions on COMPUTER-AIDED DESIGN of Integrated Circuits and Systems (TCAD).
- [J16] **Mingsong Chen**, Xin Fu, Geguang Pu and Tongquan Wei. Efficient Resource Constrained Scheduling using Parallel Two-Phase Branch-and-Bound Heuristics. IEEE Transactions on Parallel and Distributed Systems (TPDS), 28(5): 1299-1314, 2017.
- [J15] Min Yin, Junlong Zhou, Zhifang Li, Kun Cao, Jianmin Yan, Tongquan Wei, **Mingsong Chen** and Xin Fu. Fault-Tolerant Task Scheduling for Mixed-Criticality Real-Time Systems. Journal of Circuits, Systems and Computers, 26(1): 1-17, 2017.
- [J14] Siyuan Xu, Han Zhuang, Xin Fu, Junlong Zhou, and **Mingsong Chen**. GPU-Based Fluid Motion Estimation using Energy Constrain. Journal of Circuits, Systems and Computers, 26(2): 1-20, 2017,.
- [J13] **Mingsong Chen**, Xin Fu, Saijie Huang, Xiao Liu and Jifeng He. Statistical Model Checking-Based Evaluation and Optimization for Cloud Workflow Resource Allocation. IEEE Transactions on Cloud Computing, accepted.
- [J12] Jingweijia Tan, Mingsong Chen, Yang Yi, and Xin Fu, **Mitigating the Impact of Hardware Variability for GPGPUs Register File**. IEEE Transactions on Parallel and Distributed Systems (TPDS), 27(11): 3283-3297, 2016.
- [J11] Kaige Yan, Peng Lu, Mingsong Chen, and Xin Fu. **Exploring Energy-Efficient Cache Design in Emerging Mobile Platforms**. ACM Transactions on Design Automation of Electronic Systems (TODAES), 22(4): 58:1-58:20, 2017.
- [J10] Junlong Zhou, Tongquan Wei, Mingsong Chen, Yue Ma, and Sharon Hu. **Thermal-Aware Task Scheduling for Energy Minimization in Heterogeneous Real-Time MPSoC Systems**. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 35(8): 1269-1282, 2016..
- [J9] Jingweijia Tan, Zhi Li, Mingsong Chen, and Xin Fu. **Exploring Soft-Error Robust and Energy-Efficient Register File in GPGPUs using Resistive Memory**. ACM Transactions on Design Automation of Electronic Systems (TODAES), 21(2): 34:1-34:25, 2016.
- [J8] Mingsong Chen, Xiqian Zhang, Geguang Pu, Xin Fu and Prabhat Mishra. **Efficient Resource Constrained Scheduling using Parallel Structure Aware Pruning Techniques**. IEEE Transactions on Computers, 65(7): 2059-2073, 2016.
- [J7] Mingsong Chen, Xiaoke Qin and Prabhat Mishra. **Efficient Learning-Oriented Property Decomposition for Automated Generation of Directed Tests**. To appear in Journal of Electronic Testing (JETTA), 30(3): 287-306, 2014.
- [J6] Zheng Wang, Geguang Pu, Jianwen Li, Yuxiang Chen, Yongxin Zhao, Mingsong Chen, Bin Gu, Jifeng HE. **An Approach to Requirement Anaysis for Periodic Control Systems**. Frontiers of Computer Science in China, 7(4): 214-235, 2013.
- [J5] Mingsong Chen and Prabhat Mishra. **Automaitc RTL Test Generation from SystemC TLM Specifications**. ACM Transaction on Embedded Computing Systems, 11(2):38, 2012.
- [J4] Mingsong Chen and Prabhat Mishra. **Property Learning Techniques for Efficient Generation of Directed Tests**. IEEE Transactions on Computers, 60(6):852-864, 2011.
- [J3] Mingsong Chen, Prabhat Mishra and Dhruvajyoti Kalita. **Efficient Automatic Test Generation for Validation of UML Activity Diagram**. In International journal of Design

Automation for Embedded Systems, 29(3):105-130, Springer, 2010.

- [J2] Mingsong Chen and Prabhat Mishra. **Functional Test Generation using Efficient Property Clustering and Learning Techniques**. In IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 29(3):396-404, 2010.
- [J1] Mingsong Chen, Xiaokang Qiu, Wei Xu, Linzhang Wang, Jianhua Zhao, Xuandong Li. **UML Activity Diagram Based Automatic Test Case Generation for Java Programs**. In *The Computer Journal*, Oxford Press, vol 52(5), 545-556, 2009.

Conference and Workshop Papers

- [C39] Haifeng Gu, Mingsong Chen, Tongquan Wei, Li Lei, and Fei Xie. **Specification-Driven Automated Conformance Checking for Virtual Prototype and Post-Silicon Designs**. Design Automation Conference (DAC), 2018
- [C38] Junlong Zhou, Tongquan Wei, Mingsong Chen, Xiaobo Sharon Hu, Yue Ma, Gongxuan Zhang and Jianming Yan. **Variation-Aware Task Allocation and Scheduling for Improving Reliability of Real-Time MPSoCs**. Design, Automation and Test in Europe (DATE), 2018
- [C37] LiyingLi, Peijin Cong, Kun Cao, Junlong Zhou, Mingsong Chen, Tongquan Wei, **Feedback Control of Real-Time EtherCAT Networks for Reliability Enhancement in CPS**. Design, Automation and Test in Europe (DATE), 2018.
- [C36] Bicheng Liu, Shouzhen Gu, Mingsong Chen, Wang Kang, Jingtong Hu, Qingfeng Zhuge and Edwin H.-M. Sha. **An Efficient Racetrack Memory-Based Processing-In-Memory Architecture for Convolutional Neural Networks**. International Symposium on Parallel and Distributed Processing with Applications (ISPA), 2017
- [C35] Wenjie Chen, Yangyang Ma, Zhilei Chai, Mingsong Chen. **FingerVoice: A Syllable Based Input System Via Fingers Touching**. ASSETS 2017.
- [C34] Jie Liu, Jing Liu, Miaomiao Zhang, Haiying Sun, Xiaohong Chen, Dehui Du, Mingsong Chen. **An Approach to Proving Proof Obligation of Hybrid Event B Based on Differential Invariants**. COMPSAC (1) 2017: 138-143.
- [C32] P. Cong, L. Li, G. Shao, J. Zhou, M. Chen, K. Huang, and T. Wei. **User Perceived Value-Aware Cloud Pricing for Profit Maximization of Multiserver Systems**. International Conference on Parallel and Distributed Systems (ICPADS), 2017.
- [C31] W. Chen, Y. Ma, Z. Chai, M. Chen and D. He. **An FPGA-Based Real-Time Moving Object Tracking Approach**. International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP), 2017.
- [C30] M. Hassan, V. Herdt, H. M. Le, M. Chen, D. Große, and R. Drechsler. **Data flow testing for virtual prototypes**. Design Automation and Test in Europe (DATE), 2017.
- [C29] Junlong Zhou, Jianming Yan, Tongquan Wei, Mingsong Chen and X. Sharon. **Energy-Adaptive Scheduling of Imprecise Computation Tasks for QoS Optimization in Real-Time MPSoC**. Design Automation and Test in Europe (DATE), 2017.
- [C28] Kun Cao, Junlong Zhou, Min Yin, Tongquan Wei and Mingsong Chen. **Static Thermal-Aware Task Assignment and Scheduling for Makespan Minimization in Heterogeneous Real-time MPSoCs**. International Symposium on System and Software Reliability (ISSSR), 2016, to appear.

- [C27] Junlong Zhou, Jianfei Chen, Kun Cao, Tongquan Wei and Mingsong Chen. **Game Theoretic Energy Allocation for Renewable Powered In-Situ Server Systems**, International Conference on Parallel and Distributed Systems (ICPADS), 2016, to appear.
- [C26] Siyuan Xu, Weikai Miao, Thomas Kunz, Tongquan Wei and Mingsong Chen. **Quantitative Analysis of Variation-Aware Internet of Things Designs using Statistical Model Checking**, International Conference on Software Quality, Reliability & Security (QRS), 274-285, 2016.
- [C25] Yuanyang Wang, Xiaohong Chen, Haiying Sun and Mingsong Chen. **Choosing the Best Strategy for Energy Aware Building System: an SVM-based Approach**, International Conference on Software Engineering and Knowledge Engineering (SEKE), 2016.
- [C24] Haiying Sun, Mingsong Chen, Min Zhang, Jing Liu, Ying Zhang. **Improving Defect Detection Ability of Derived Test Cases Based on Mutated UML Activity Diagrams**, International Computers, Software & Applications Conference (COMPSAC) 2016.
- [C23] Fan Gu, Xinqian Zhang, Mingsong Chen, Daniel Grosse, Rolf Drechsler. **Timing Analysis of UML Activity Diagrams Using Statistical Model**. *Design Automation and Test in Europe (DATE)*, 2016.
- [C22] Xiaohong Chen, Fan Gu, Mingsong Chen, Dehui Du, Jing Liu, Haiying Sun. **Evaluating Energy Consumption for Cyber-Physical Energy System: an Environment Ontology based Approach**. *IEEE Computer Software and Applications Conference (COMPSAC)*, 2015.
- [C21] Mingsong Chen, Daian Yue, Xiaoke Qin, Xin Fu and Prahbat Mishra. **Variation-Aware Evaluation for MPSoC Task Allocation and Scheduling Strategies using Statistical Model Checking**. *Design, Automation and Test in Europe (DATE)*, Grenoble, 2015.
- [C20] Saijie Huang, Mingsong Chen, Xiao Liu, Dehui Du, Xiaohong Chen. **Variation-Aware Resource Allocation Evaluation for Cloud Workflows using Statistical Model Checking**. *IEEE International Conf. on Big Data and Cloud Computing (BDCloud)*, 2014.
- [C19] Ang Li, Zishan Qin, Mingsong Chen, Jing Liu. **ADAutomation: An Activity Diagram Based Automated GUI Testing Framework for Smartphone Applications**. *IEEE International Conference, on Software Security and Reliability*, San Francisco, 2014.
- [C18] Dehui Du, Mingsong Chen, Xiao Liu, Yun Yang. **A Novel Quantitative Evaluation Approach for Software Project Schedules using Statistical Model Checking**. *International Conference on Software Engineering (ICSE) NIER Track*, Hyderabad, India, 2014.
- [C17] Mingsong Chen, Fan Gu, Lei Zhou, Geguang Pu and Xiao Liu. **Efficient Two-Phase Approaches for Branch-and-Bound Style Resource Constrained Scheduling**. *International Conference on VLSI Design*, 2014.
- [C16] Zhucheng Shao, Jing Liu, Zuohua Ding, Mingsong Chen, Ningkan Jiang. **Spatio-temporal Properties Analysis for Cyber-physical Systems**. International Conference on Engineering of Complex Computer Systems (ICECCS) 2013
- [C15] Mingsong Chen, Lei Zhou, Geguang Pu and Jifeng HE. **Bound-Oriented Parallel Pruning Approaches for Efficient Resource Constrained Scheduling of High-Level Synthesis**. *International Conference on Hardware/Software Codesign and System Synthesis Design (CODES+ISSS)*, 2013.

- [C14] Mingsong Chen, Saijie Huang, Geguang Pu and Prabhat Mishra. **Branch-and-Bound Style Resource Constrained Scheduling using Efficient Structure-Aware Pruning**. International Symposium on VLSI (ISVLSI), 2013.
- [C13] Mingsong Chen and Prabhat Mishra. **Assertion-Based Functional Consistency Checking between TLM and RTL Models**. *International Conference on VLSI Design*, Pune, India, 2013. (*Nominated for best paper award*)
- [c12] Ang Li and Mingsong Chen. **Efficient Self-learning Techniques for SAT-based Test Generation**. In Proceedings of the International Conference on Hardware/Software Codesign and System Synthesis esign (CODES+ISSS). Pages-, 2012.
- [C11] Z. Wu, Jing Liu, Xiaohong Chen, and Mingsong Chen. **An approach to communicating process modeling of MARTE**. Fourth Asia-Pacific Symposium on Internetware (Internetware), 2012.
- [C10] Xiaohong Chen and Mingsong Chen. **Extending the Four-Variable Model for Cyber-Physical Systems**. ISORC workshop, 31-36, 2012.
- [C9] Mingsong Chen and Prabhat Mishra. **Decision Ordering Based Property Decomposition for Functional Test Generation**. Design, Automation and Test in Europe (DATE). Pages-, Grenoble, France, 14-18 March, 2011.
- [C8] Mingsong Chen. **Efficient Approaches For Functional Validation of SOC Designs Using High-Level Specifications**, Design Automation Conference, PHD Forum, 2010.
- [C7] Mingsong Chen, Xiaoke Qin and Prabhat Mishra, **Efficient Decision Ordering Techniques for SAT-based Test Generation**, Design, Automation and Test in Europe (DATE) , 490-495, 2010.
- [C6] Xiaoke Qin, Mingsong Chen and Prabhat Mishra, **Synchronized Generation of Directed Tests using Satisfiability Solving**, *International Conference on [VLSI Design](#)*, pages -, Bangalore, India, January 3-7, 2010.
- [C5] Prabhat Mishra and Mingsong Chen. **Efficient Techniques for Directed Test Generation using Incremental Satisfiability**. Accepted by 22nd *International Conference on VLSI Design ([VLSI 2009](#))*, New Delhi, India, Jan. 5-9, 2009. (*Nominated for best paper award*)
- [C4] Mingsong Chen, Prabhat Mishra and Dhruvajyoti Kalita. **Coverage-driven Automatic Test Generation for UML Activity Diagrams**. *ACM Great Lakes Symposium on VLSI ([GLSVLSI](#))*. Orlando, USA, May 4 - 6, 2008.
- [C3] Mingsong Chen, Prabhat Mishra and Dhruvajyoti Kalita. **Towards RTL Test Generation from SystemC TLM Specifications**. *IEEE International High Level Design Validation and Test Workshop ([HLDVT](#))*. pages - , Irvine, California, November 7-9, 2007
- [C2] Jeeyoung Kim, Yi Du, Mingsong Chen, Ahmed Helmy. **Comparing Mobility and Predictability of VoIP and WLAN Traces**. *CRAWDAD Workshop 2007 (Co-located with [MobiCom](#))*. Montréal, Canada, September, 2007
- [C1] Mingsong Chen, Xiaokang Qiu, Xuandong Li. **Automatic Test Case Generation for UML Activity Diagrams**. *First International Workshop on Automation on Software Test (AST)*. pages 2-8, Shanghai, May, 2006

Thesis

- [T3] "**Efficient Approaches for Functional Validation of SoC Design using High Level Specifications**". Ph.D. Dissertation in University of Florida. Advisor: Prof. Prabhat Msirha
- [T2] "**Dynamic Optimization Techniques for State Space in Timed Automata during Reachability Analysis**". Thesis for the Degree of Master in Nanjing University, China. Advisor: Prof. Xuandong Li and Prof. Jianhua Zhao
- [T1] "**Checking the time consistence of Message Sequence Chart**". Thesis for the Degree of Bachelor in Nanjing University, China. Advisor: Prof. Xuandong Li