

Qi Zhu

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Summary

Dr. Qi Zhu is a tenured Associate Professor at the Department of Electrical and Computer Engineering (ECE) in Northwestern University. He was an Assistant Professor and later Associate Professor at the ECE Department in University of California, Riverside from 2011 to 2017, and a Research Scientist at the Strategic CAD Labs in Intel from 2008 to 2011. Dr. Zhu received a Ph.D. in EECS from University of California, Berkeley in 2008, and a B.E. in CS from Tsinghua University in 2003. His research interests include model-based design, synthesis and verification of cyber-physical systems (CPS) and Internet of Things, CPS security, embedded and real-time systems, connected and autonomous vehicles, energy-efficient buildings and infrastructures, and system-on-chip design. He received best paper awards at Design Automation Conference (DAC) 2006, DAC 2007, International Conference on Cyber-Physical Systems (ICCPs) 2013, and ACM Transactions on Design Automation of Electronic Systems (TODAES) 2016. He received the NSF CAREER award in 2016, and the IEEE TCCPS (Technical Committee on Cyber-Physical Systems) Early-Career Award in 2017.

Dr. Zhu is an Associate Editor for IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), IET Cyber-Physical Systems: Theory & Applications, and IEEE TCCPS Newsletter. He served as an Associate Editor for IEEE TC-VLSI Newsletter and ACM SIGDA e-Newsletter; and as a Guest Editor for the Proceedings of the IEEE and ACM Transactions on Cyber-Physical Systems (TCPS). He is the Conference Chair of IEEE TCCPS. Dr. Zhu has served on the technical program committee and as organizer for a number of conferences in design automation, cyber-physical systems, embedded systems, and real-time systems, including DAC, ICCAD, DATE, ASP-DAC, ICCPS, CODES+ISSS, RTSS, RTAS, ICSS, GLVLSI, SAC, SIES, MEMOCODE, SAMOS, FDL, etc. He received the ACM SIGDA Service Award in 2015.

Education

University of California, Berkeley	Electrical Engineering and Computer Sciences	Ph.D. 2008
Tsinghua University	Computer Science and Technology	B.E. 2003

Professional Experience

Associate Professor	Department of Electrical Engineering and Computer Science	January 2018 – present	Northwestern University
Associate Professor		July 2017 – December 2017	
Assistant Professor	Department of Electrical and Computer Engineering	August 2011 – June 2017	University of California, Riverside
Research Scientist		October 2008 – August 2011	
Strategic CAD Laboratories			Intel Corporation

Awards and Honors

- IEEE Technical Committee on Cyber-Physical Systems (TCCPS) Early-Career Award, 2017
- Humboldt Research Fellowship for Experienced Researchers, 2017
- National Science Foundation CAREER Award, 2016
- Best Paper Award in the ACM Transactions on Design Automation of Electronic Systems (TODAES), 2016
- Best Paper Award at the 4th IEEE/ACM International Conference on Cyber-Physical Systems (ICCPS), 2013
- Best Paper Award at the 44th IEEE/ACM Design Automation Conference (DAC), 2007
- Best Paper Award at the 43rd IEEE/ACM Design Automation Conference (DAC), 2006
- Best Paper Award Nomination at the 21st IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC), 2016
- Best Paper Finalist at the 9th IEEE International Symposium on Industrial Embedded Systems (SIES), 2014
- Regents Faculty Development Award, University of California, 2016
- ACM SIGDA Service Award, 2015
- Regents Faculty Fellowship Award, University of California, 2013
- Invited Speaker at the IEEE Council for Electronic Design Automation (CEDA) Distinguished Speaker Series, 2008
- Pao Family Fellowship from University of California, Berkeley, 2003 – 2004
- Beijing Outstanding Undergraduate Award, 2003
- Tsinghua University Outstanding Undergraduate Award, 2003
- Tsinghua University Outstanding Undergraduate Dissertation Award, 2003

Selected Publications

Model-based design, synthesis and verification of CPS and embedded systems:

- Chao Huang, Wenchao Li and Qi Zhu, “Formal Verification of Weakly-Hard Systems”, to appear in the 22nd ACM International Conference on Hybrid Systems: Computation and Control (HSCC’19), Montreal, Canada, April, 2019.
- Shuyue Lan, Chao Huang, Zhilu Wang, Hengyi Liang, Wenhao Su and Qi Zhu, “Design Automation for Intelligent Automotive Systems”, 49th IEEE International Test Conference (ITC’18), Phoenix, AZ, October, 2018.
- Peng Deng, Qi Zhu, Abhijit Davare, Anastasios Mourikis, Xue Liu and Marco Di Natale, “An Efficient Control-driven Period Optimization Algorithm for Distributed Real-time Systems”, IEEE Transactions on Computers (TC), Vol. 65, No. 12, December, 2016.
- Bowen Zheng, Chung-Wei Lin, Huafeng Yu, Hengyi Liang and Qi Zhu, “CONVINCE: A Cross-Layer Modeling, Exploration and Validation Framework for Next-Generation Connected Vehicles”, 35th IEEE/ACM International Conference on Computer-Aided Design (ICCAD’16), Austin, TX, November, 2016. (*Invited Paper*)

- Bowen Zheng, Yue Gao, Qi Zhu and Sandeep Gupta, “Analysis and Optimization of Soft Error Tolerance Strategies for Real-time Systems”, 13th IEEE/ACM International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS’15), Amsterdam, Netherlands, October, 2015.
- Peng Deng, Fabio Cremona, Qi Zhu, Marco Di Natale and Haibo Zeng, “A Model-based Synthesis Flow for Automotive CPS”, 6th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS’15), Seattle, WA, April, 2015.
- Peng Deng, Qi Zhu, Marco Di Natale and Haibo Zeng, “Task Synthesis for Latency-sensitive Synchronous Block Diagram”, 9th IEEE International Symposium on Industrial Embedded Systems (SIES’14), Pisa, Italy, June, 2014. (**Best Paper Award Finalist**)
- Qi Zhu, Peng Deng, Marco Di Natale and Haibo Zeng, “Robust and Extensible Task Implementations of Synchronous Finite State Machines”, 16th IEEE/ACM Conference on Design, Automation and Test in Europe (DATE’13), Grenoble, France, March, 2013.
- Qi Zhu, Haibo Zeng, Wei Zheng, Marco Di Natale and Alberto Sangiovanni-Vincentelli, “Optimization of Task Allocation and Priority Assignment in Hard Real-Time Distributed Systems”, ACM Transactions on Embedded Computing Systems (TECS), Vol. 11, No. 4, December, 2012.
- Abhijit Davare, Qi Zhu, Marco Di Natale, Claudio Pinello, Sri Kanajan and Alberto Sangiovanni-Vincentelli, “Period Optimization for Hard Real-time Distributed Automotive Systems”, 44th IEEE/ACM Design Automation Conference (DAC’07), San Diego, CA, June, 2007. (**Best Paper Award**)

Cyber-physical security:

- Bowen Zheng, Chung-Wei Lin, Shinichi Shiraishi and Qi Zhu, “Design and Analysis of Delay-Tolerant Intelligent Intersection Management”, accepted by the ACM Transactions on Cyber-Physical Systems.
- Hengyi Liang, Matthew Jagielski, Bowen Zheng, Chung-Wei Lin, Eunsuk Kang, Shinichi Shiraishi, Cristina Nita-Rotaru and Qi Zhu, “Network and System Level Security in Connected Vehicle Applications”, 37th IEEE/ACM International Conference on Computer-Aided Design (ICCAD’18), San Diego, CA, November, 2018.
- Bowen Zheng, Muhammed O. Sayin, Chung-Wei Lin, Shinichi Shiraishi and Qi Zhu, “Timing and Security Analysis Framework for VANET-based Intelligent Transportation Systems”, 36th IEEE/ACM International Conference on Computer-Aided Design (ICCAD’17), Irvine, CA, November, 2017.
- Bowen Zheng, Peng Deng, Rajasekhar Anguluri, Qi Zhu and Fabio Pasqualetti, “Cross-Layer Codesign for Secure Cyber-Physical Systems”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Vol. 35, No. 5, May, 2016.
- Chung-Wei Lin, Bowen Zheng, Qi Zhu and Alberto Sangiovanni-Vincentelli, “Security-Aware Methodology and Optimization for Automotive Systems”, ACM Transactions on Design Automation of Electronic Systems (TODAES), Vol. 21, No. 1, December, 2015. (**Best Paper Award**)
- Bowen Zheng, Wenchao Li, Peng Deng, Leonard Gerard, Qi Zhu and Natarajan Shankar, “Design and Verification for Transportation System Security”, 52nd ACM/IEEE Design Automation Conference (DAC’15), San Francisco, CA, June, 2015. (*Invited Paper*)

- Chung-Wei Lin, Qi Zhu and Alberto Sangiovanni-Vincentelli, “Security-Aware Mapping for TDMA-Based Real-Time Distributed Systems”, 33rd IEEE/ACM International Conference on Computer-Aided Design (ICCAD’14), San Jose, CA, November, 2014.
- Chung-Wei Lin, Qi Zhu, Calvin Phung and Alberto Sangiovanni-Vincentelli, “Security-Aware Mapping for CAN-Based Real-Time Distributed Automotive Systems”, 32nd IEEE/ACM International Conference on Computer-Aided Design (ICCAD’13), San Jose, CA, November, 2013.

Energy-efficient buildings:

- Tianshu Wei, Xiaoming Chen, Xin Li and Qi Zhu, “Model-based and Data-driven Approaches for Building Automation and Control”, 37th IEEE/ACM International Conference on Computer-Aided Design (ICCAD’18), San Diego, CA, November, 2018.
- Tianshu Wei, Yanzhi Wang and Qi Zhu, “Deep Reinforcement Learning for HVAC Control in Smart Buildings”, 54th IEEE/ACM Design Automation Conference (DAC’17), Austin, TX, June, 2017.
- Tianshu Wei, Qi Zhu and Nanpeng Yu, “Proactive Demand Participation of Smart Buildings in Smart Grid”, IEEE Transactions on Computers (TC), Vol. 65, No. 5, May, 2016.
- Tiansong Cui, Shuang Chen, Yanzhi Wang, Qi Zhu, Shahin Nazarian and Massoud Pedram, “Optimal Co-Scheduling of HVAC Control and Battery Management for Energy-Efficient Buildings Considering State-of-Health Degradation”, 21st IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC’16), Macao, China, January, 2016. (**Best Paper Award Nomination**)
- Tianshu Wei, Qi Zhu and Mehdi Maasoumy, “Co-scheduling of HVAC Control, EV Charging and Battery Usage for Building Energy Efficiency”, 33rd IEEE/ACM International Conference on Computer-Aided Design (ICCAD’14), San Jose, CA, November, 2014.
- Tianshu Wei, Taeyoung Kim, Sangyoung Parky, Qi Zhu, Sheldon X.-D. Tan, Naehyuck Changy, Sadrul Ula and Mehdi Maasoumy, “Battery Management and Application for Energy-Efficient Buildings”, 51st IEEE/ACM Design Automation Conference (DAC’14), San Francisco, CA, June 2014.
- Mehdi Maasoumy, Qi Zhu, Cheng Li, Forrest Meggers and Alberto Sangiovanni-Vincentelli, “Co-design of Control Algorithm and Embedded Platform for HVAC Systems”, 4th IEEE/ACM International Conference on Cyber-Physical Systems (ICCPs’13), Philadelphia, PA, April, 2013. (**Best Paper Award**)

Others:

- Qi Zhu and Alberto Sangiovanni-Vincentelli, “Codesign Methodologies and Tools for Cyber-Physical Systems”, Proceedings of the IEEE, Vol. 106, No. 9, September, 2018.
- Shuyue Lan, Rameswar Panda, Qi Zhu and Amit K. Roy-Chowdhury, “FFNet: Video Fast-Forwarding via Reinforcement Learning”, 30th IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR’18), Salt Lake City, Utah, June, 2018.
- Sanjit Seshia, Shiyuan Hu, Wenchao Li and Qi Zhu, “Design Automation of Cyber-Physical Systems: Challenges, Advances, and Opportunities”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Vol. 36, No. 9, September, 2017. (*Keynote Paper*)

- Abhijit Davare, Douglas Densmore, Liangpeng Guo, Roberto Passerone, Alberto Sangiovanni-Vincentelli, Alena Simalatsar and Qi Zhu, “METROII: A Design Environment for Cyber-Physical Systems”, ACM Transactions on Embedded Computing Systems (TECS), Vol. 12, No. 49, March, 2013. (author names listed in alphabetical order)
- Qi Zhu, Nathan Kitchen, Andreas Kuehlmann and Alberto Sangiovanni-Vincentelli, “SAT Sweeping with Local Observability Don’t-Cares”, 43rd IEEE/ACM Design Automation Conference (DAC’06), San Francisco, CA, July, 2006. (**Best Paper Award**)

Professional Activities

- *General Chair* of the 15th IEEE International Conference on Embedded Software and Systems (ICCESS), 2019
- *Workshops Chair* of the Cyber-Physical Systems and Internet-of-Things Week (CPS-IoT Week), 2019
- *Program Chair* of the 1st ACM/IEEE Workshop on Design Automation for CPS and IoT (DESTION), 2019
- *Hot-Topic Day Chair* of the 40th IEEE Real-Time Systems Symposium (RTSS), 2019
- *Chair* of the 3rd IEEE International Workshop on Design Automation for Cyber-Physical Systems, 2018
- *Co-Chair* of the 1st IEEE International Workshop on Design Automation for Cyber-Physical Systems, 2016
- *Local Chair* of the 28th ACM Great Lakes Symposium on VLSI (GLVLSI), 2018.
- *Chair* of the ACM SIGDA University Demonstration at DAC, 2018
- *Vice Chair* of the ACM SIGDA University Demonstration at DAC, 2017
- *Publicity Chair* of the ACM SIGDA University Demonstration at DAC, 2016
- *Technical Program Committee Member*:
 IEEE/ACM Design, Automation and Test in Europe (DATE) 2017 – 2019
 ACM Symposium on Applied Computing (SAC) 2019 (Track Chair), 2015 – 2017
 IEEE/ACM Design Automation Conference (DAC) 2018, 2012 – 2014
 IEEE/ACM International Conference on Hardware/Software Codesign and System Synthesis (COEES+ISSS) 2015 – 2018
 IEEE/ACM International Conference on Cyber-Physical Systems (ICCPS) 2018
 IEEE International Green and Sustainable Computing Conference (IGSC) 2017
 IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC) 2015 – 2017
 IEEE/ACM International Conference on Formal Methods and Models for Codesign (MemoCODE) 2017, 2013, 2012
 IEEE International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation (SAMOS) 2015 – 2017
 IEEE Real-Time Systems Symposium (RTSS) 2016
 IEEE International Symposium on Industrial Embedded Systems (SIES) 2013 – 2016
 IEEE Forum on Specification and Design Languages (FDL) 2016
 IEEE/ACM International Conference on Computer-Aided Design (ICCAD) 2013 – 2015

IEEE International Conference on Embedded Software and Systems (ICESS) 2015
(Subcommittee Chair)

IEEE International Symposium on Nanoelectronic and Information Systems (iNIS) 2015
(Subcommittee Chair)

IEEE International Conference on Emerging Technology & Factory Automation 2014, 2013

IEEE Real-time and Embedded Technology and Applications Symposium (RTAS) 2012

IEEE International Conference on Parallel and Distributed Systems (ICPADS) 2012

IEEE International Conference on Embedded Software and Systems (ICESS) 2011

IEEE International Symposium on VLSI Design, Automation and Test 2010 – 2013

- *Session Organizer* at ICCAD 2018, ICCAD 2017, DAC 2017, ICCAD 2016, DAC 2015
- *Session Chair* at DAC 2018, DAC 2017, ICCAD 2016, DAC 2016, HLDVT 2016, ISPD 2016, DAC 2014, ICCAD 2013, MemoCODE 2012
- *Member and Conference Chair* of the IEEE Technical Committee on Cyber-Physical Systems (TCCPS)
- *Associate Editor* of the IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 2018 – present
- *Associate Editor* of the IET Cyber-Physical Systems: Theory & Applications, 2016 – present
- *Associate Editor* of the IEEE TCCPS Newsletter, 2016 – present
- *Associate Editor* of the IEEE TC-VLSI Newsletter, 2016 – present
- *Associate Editor* of the ACM SIGDA e-Newsletter, 2013 – 2016
- *Guest Editor* for the Proceedings of the IEEE, 2017 – 2018
- *Guest Editor* for the ACM Transactions on Cyber-Physical Systems, 2016
- *Panelist* for NSF, 2018, 2017, 2016; *Ad-hoc Reviewer* for NSF, 2018, 2014, 2012
- *Reviewer* for Hong Kong Research Grant Council (RGC), 2018, 2017, 2016
- *Reviewer* for Springer book chapters, 2016, 2012
- *Reviewer* for Masri Institute of Energy and Natural Resources, 2016
- *Reviewer for Journals*, including IEEE Transactions on Computers (TC), IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Proceedings of the IEEE, IEEE Transactions on Industrial Informatics (TII), IEEE Transactions on Systems, Man, and Cybernetics (TSMC), IEEE Transactions on Parallel and Distributed Systems (TPDS), IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), IEEE Transactions on Computational Social Systems (TCSS), IEEE Transactions on Very Large Scale Integration Systems (TVLSI), IEEE Software, IEEE Embedded Systems Letters (ESL), IEEE Consumer Electronics Magazine, ACM Transactions on Cyber-Physical Systems (TCPS), ACM Transactions on Embedded Computing Systems (TECS), ACM Transactions on Design Automation of Electronic Systems (TODAES), ACM Transactions on Architecture and Code Optimization (TACO), ACM Journal of Emerging Technologies in Computing Systems (JETC), European Association for Signal Processing Journal on Embedded Systems, Journal of Systems Architecture, Design Automation for Embedded Systems (DAES), Real-Time Systems, Leibniz Transactions on Embedded Systems , Integration, the VLSI Journal.

Talks

- “Network and System Level Security in Connected Vehicle Applications”, 37th IEEE/ACM International Conference on Computer-Aided Design (ICCAD’18), November, 2018.
- “Model-based and Data-driven Approaches for Building Automation and Control”, 37th IEEE/ACM International Conference on Computer-Aided Design (ICCAD’18), November, 2018.
- “Design Automation for Intelligent Automotive Systems”, 49th IEEE International Test Conference (ITC’18), October, 2018.
- “Panel: Future of CPS: Here to stay or another fad?”, ESWEEK 2018, October, 2018.
- “Beyond Functionality: Combating Timing and Security Challenges in the Design of Intelligent Systems”, ShanghaiTech Workshop on Emerging Devices, Circuits and Systems, June, 2018.
- “Timing and Security Analysis Framework for VANET-based Intelligent Transportation Systems”, 36th IEEE/ACM International Conference on Computer-Aided Design (ICCAD’17), November, 2017.
- “Addressing Extensibility and Fault Tolerance in CAN-based Automotive Systems”, 11th IEEE/ACM International Symposium on Networks-on-Chip (NOCS’17), October, 2017.
- “Extensibility-Driven Automotive In-Vehicle Architecture Design”, 54th IEEE/ACM Design Automation Conference (DAC’17), June, 2017.
- “Design Automation for Tackling Key Challenges in Cyber-Physical Systems: Timing, Security, and Heterogeneity”, United Technologies Research Center, June, 2017.
- “Delay-Aware Design, Analysis and Verification of Intelligent Intersection Management”, 3rd IEEE International Conference on Smart Computing (SMARTCOMP’17), May, 2017.
- “Design Automation for Time-Critical Cyber-Physical Systems”, Fudan University, May, 2017.
- “Design Automation for Tackling Key Challenges in Cyber-Physical Systems: Timing, Security, and Heterogeneity”, Northwestern University, University of Washington, University of California at Santa Barbara, University of California at San Diego, University of Maryland at College Park, February to April, 2017.
- “Design Automation for Cyber-Physical Systems: Challenges and Opportunities”, tutorial at the 18th IEEE International Symposium on Quality Electronic Design (ISQED), 2017.
- “Addressing Time and Security in Cyber-Physical Systems”, University of Southern California, January, 2017.
- “Design Automation for Cyber-Physical Systems: Challenges and Opportunities”, Tsinghua University, Peking University, Chinese Academy of Sciences, December, 2016.
- “SOLSTICe: Software Synthesis with Timing Contracts for Cyber-Physical Systems”, Seventh Annual Cyber-Physical Systems Principal Investigators’ Meeting, October, 2016.
- “Design Automation for Cyber-Physical Systems”, University of Pennsylvania, Boston University, Syracuse University, September, 2016.
- “Cross-layer Software Synthesis for Dependable and Secure Automotive Systems”, 4th International Workshop on Cross-layer Reliability, July, 2016.

- “Next Generation Automotive Architecture Modeling and Exploration for Autonomous Driving”, 15th IEEE Computer Society Annual Symposium on VLSI (ISVLSI’16), July, 2016.
- “Design Automation of Cyber-Physical Systems: from Cars to Buildings”, University of Science and Technology of China, Nanjing University, East China Normal University, June, 2016.
- “Co-scheduling of Flexible Energy Loads in Building Clusters”, 49th IEEE International Symposium on Circuits and Systems (ISCAS’16), May, 2016.
- “Design Automation of Cyber-Physical Systems: from Cars to Buildings”, Technical University of Munich, March, 2016.
- “Design Automation of Cyber-Physical Systems: from Cars to Buildings”, University of Southern California, January, 2016.
- “Proactive Demand Participation of Heterogeneous Flexible Loads in Smart Grid”, 6th IEEE International Green and Sustainable Computing Conference (IGSC’15), December, 2015.
- “Model-based Design and Synthesis of IoT Applications”, Internet-of-Things Symposium at ESWeek, October, 2015.
- “Analysis and Optimization of Soft Error Tolerance Strategies for Real-time Systems”, 13th IEEE/ACM International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS’15), October, 2015.
- “Model-based Design and Synthesis of Cyber-Physical Systems: from Cars to Buildings”, The Chinese University of Hong Kong, August, 2015.
- “Building Smart Cities with IoT: from Infrastructure to Transportation”, International Symposium on Design Technologies for IoT, August, 2015.
- “Model-based Design and Synthesis of Automotive Cyber-Physical Systems”, SYSU-CMU Joint Institute of Engineering, August, 2015.
- “Metronomy: A Function-Architecture Co-simulation Framework for Timing Verification of Cyber-Physical Systems”, 12th IEEE/ACM International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS’14), October, 2014.
- “Model-based Synthesis of Cyber-Physical Systems”, UCLA, September, 2014.
- “Model-based Synthesis for Real-time Embedded Systems”, 57th IEEE International Midwest Symposium on Circuits and Systems (MWSCAS’14), August, 2014.
- “Model-based Design and Synthesis of Automotive Embedded Systems”, Toyota, July, 2014.
- “Task Synthesis for Latency-sensitive Synchronous Block Diagram”, 9th IEEE International Symposium on Industrial Embedded Systems (SIES’14), June, 2014.
- “Model-based Design and Synthesis for Distributed Embedded Systems: from Smart Cars to Smart Buildings”, SRI International, June, 2014.
- “Design Synthesis and Optimization for Automotive Embedded Systems”, 14th International Symposium on Physical Design (ISPD’14), March, 2014.
- “Design of Distributed Embedded Systems: from Smart Car to Smart Building”, University of Southern California, September, 2013.
- “Design of Distributed Embedded Systems”, University of Texas at San Antonio, June, 2013.

- “Robust and Extensible Task Implementations of Synchronous Finite State Machines”, 16th IEEE/ACM Conference on Design, Automation and Test in Europe (DATE’13), March, 2013.
- “Platform-based Design for Distributed Embedded Systems”, Cornell University, Peking University, The Ohio State University, University of California at Riverside, University of Minnesota, Spring, 2011.
- “Architectural/Micro-architectural Exploration on Virtual Platforms”, Virtual Platform Workshop at 46th Design Automation Conference (DAC), July, 2009.
- “Optimizing Extensibility in Hard Real-time Distributed Systems”, 15th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS’09), April, 2009.
- “A Formal Approach for Optimizing Mapping in System Level Design”, TECHCON 2008, November, 2008.
- “Period Optimization for Hard Real-time Distributed Automotive Systems”, IEEE Council on Electronic Design Automation (CEDA) Distinguished Speaker Series, April, 2008.
- “An Extensible Synthesis Approach for Meeting Latency Requirements in Distributed Systems”, GSRC Annual Symposium, September, 2007.
- “Proposals for Metro II Execution Semantics for Mapping”, GSRC Annual Symposium, September, 2007.
- “MetroII: Main Features and Progress Update”, GSRC Workshop, June, 2007.
- “MetroII: Main Features and Pre-Alpha Release”, GSRC Workshop, March, 2007.
- “MetroII”, GSRC Workshop, December, 2006.
- “Common Modeling Domain for System Level Design”, GSRC Workshop, December, 2006.
- “A Semantic-Driven Synthesis Flow for Platform-Based Design”, 4th IEEE/ACM International Conference on Formal Methods and Models for Codesign, July, 2006.
- “SAT Sweeping with Local Observability Don’t Cares”, 43rd Design Automation Conference (DAC’06), July, 2006.

Teaching

At Northwestern University:

- Modeling and Synthesis of Cyber-Physical Systems (EECS 495/395): Winter 2019, Winter 2018.
- Connected and Autonomous Vehicles: Challenges and Design (EECS 495/395): Winter 2019

At University of California, Riverside:

- Modeling and Synthesis of Cyber-Physical Systems (EE 258 / CS 256): Winter 2017.
- Embedded Systems Design – New Principles and Applications (EE 260): Winter 2016, Winter 2015, Winter 2014, Fall 2012.
- Logic Design (EE/CS 120A): Fall 2017, Winter 2017, Fall 2016, Winter 2016, Fall 2015, Winter 2015, Fall 2014, Winter 2014, Fall 2013, Winter 2013, Fall 2012, Fall 2011.
- Digital Integrated Circuit Layout and Design (EE 134): Winter 2012.

Student Advising

- Current Group: Shuyue Lan (PhD), Hengyi Liang (PhD), Zhilu Wang (PhD), Xiangguo Liu (PhD), Shichao Xu (PhD), Chao Huang (Postdoc), Varshini Jeevaraj (MS), Yinni Jin (MS).
- Alumni: Bowen Zheng (PhD, graduated in 2018), Tianshu Wei (PhD, graduated in 2018), Peng Deng (PhD, graduated in 2016); Li Chen (MS, graduated in 2017), Xiaoxiong Ding (MS, graduated in 2017), Beixing Yin (MS, graduated in 2016), Yunjian Zhang (MS, graduated in 2016), Aditya Swarup (MS, graduated in 2016), Zhuofu Deng (MS, graduated in 2016), Shuheng Li (MS, graduated in 2015), Priyanka Khire (MS, graduated in 2015), Chi-Wei Huang (MS, graduated in 2015), Zhonghua Zhou (MS, graduated in 2014); Hyunjong Choi, Di Chen, Bryan Glenn Marsh, Calvin Phung; David Zhu (undergraduate), Patrick Smith (undergraduate), Andrew Olguin (undergraduate), Ellison Zhu (undergraduate), Gavin Huang (undergraduate), Jason Terrado (undergraduate), Mark Asfour (undergraduate), Stanley Chang (undergraduate).

Full Publication List (reverse chronological order)

Journal Articles:

1. Bowen Zheng, Chung-Wei Lin, Shinichi Shiraishi and Qi Zhu, “Design and Analysis of Delay-Tolerant Intelligent Intersection Management”, accepted by the ACM Transactions on Cyber-Physical Systems.
2. Qi Zhu and Alberto Sangiovanni-Vincentelli, “Codesign Methodologies and Tools for Cyber-Physical Systems”, Proceedings of the IEEE, Vol. 106, No. 9, September, 2018.
3. Qi Zhu, Alberto Sangiovanni-Vincentelli, Shiyang Hu and Xin Li, “Design Automation for Cyber-Physical Systems [Scanning the Issue]”, Proceedings of the IEEE, Vol. 106, No. 9, September, 2018.
4. 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”, IEEE Transactions on Sustainable Computing (TSUSC), Vol. 3, No. 2, April, 2018.
5. Ying Zhang, Mohammad Hajiesmaili, Sinan Cai, Minghua Chen and Qi Zhu, “Peak-Aware Online Economic Dispatching for Microgrids”, IEEE Transactions on Smart Grid (TSG), Vol. 9, No. 1, January, 2018.
6. Yongxiang Bao, Mingsong Chen, Qi Zhu, Tongquan Wei, Frederic Mallet and Tingliang Zhou, “Quantitative Performance Evaluation of Uncertainty-Aware Hybrid AADL Designs Using Statistical Model Checking”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Vol. 36, No. 12, December, 2017.
7. Sanjit Seshia, Shiyang Hu, Wenchao Li and Qi Zhu, “Design Automation of Cyber-Physical Systems: Challenges, Advances, and Opportunities”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Vol. 36, No. 9, September, 2017. (*Keynote Paper*)
8. Tiansong Cui, Shuang Chen, Yanzi Wang, Qi Zhu, Shahin Nazarian and Massoud Pedram, “An Optimal Energy Co-Scheduling Framework for Smart Buildings”, Integration, the VLSI Journal, Vol. 58, June, 2017.

9. Peng Deng, Qi Zhu, Abhijit Davare, Anastasios Mourikis, Xue Liu and Marco Di Natale, "An Efficient Control-driven Period Optimization Algorithm for Distributed Real-time Systems", *IEEE Transactions on Computers (TC)*, Vol. 65, No. 12, December, 2016.
10. Samarjit Chakraborty, Mohammad Abdullah Al Faruque, Wanli Chang, Dip Goswami, Marilyn Wolf, Qi Zhu, "Automotive Cyber-Physical Systems: A Tutorial Introduction", *IEEE Design and Test*, Vol. 33, No. 4, August, 2016.
11. Bowen Zheng, Peng Deng, Rajasekhar Anguluri, Qi Zhu and Fabio Pasqualetti, "Cross-Layer Codesign for Secure Cyber-Physical Systems", *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, Vol. 35, No. 5, May, 2016.
12. Tianshu Wei, Qi Zhu and Nanpeng Yu, "Proactive Demand Participation of Smart Buildings in Smart Grid", *IEEE Transactions on Computers (TC)*, Vol. 65, No. 5, May, 2016.
13. Chung-Wei Lin, Bowen Zheng, Qi Zhu and Alberto Sangiovanni-Vincentelli, "Security-Aware Methodology and Optimization for Automotive Systems", *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, Vol. 21, No. 1, December, 2015. (***Best Paper Award***)
14. Fabio Pasqualetti and Qi Zhu, "Design and Operation of Secure Cyber-Physical Systems", *IEEE Embedded Systems Letters*, March, 2015. (***Top-five Accessed Article***)
15. Chung-Wei Lin, Qi Zhu and Alberto Sangiovanni-Vincentelli, "Security-Aware Modeling and Efficient Mapping for CAN-Based Real-Time Distributed Automotive Systems", *IEEE Embedded Systems Letters*, March, 2015. (***Top-five Accessed Article***)
16. Haibo Zeng, Marco Di Natale and Qi Zhu, "Minimizing Stack and Communication Memory Usage in Real-time Embedded Applications", *ACM Transactions on Embedded Computing Systems (TECS)*, Vol. 13, No. 149, November, 2014.
17. Marco Di Natale, Qi Zhu, Alberto Sangiovanni-Vincentelli and Stavros Tripakis, "Optimized Implementation of Synchronous Models on Industrial LTTA Systems", *Journal of Systems Architecture (JSA)*, Vol. 60, April, 2014.
18. Abhijit Davare, Douglas Densmore, Liangpeng Guo, Roberto Passerone, Alberto Sangiovanni-Vincentelli, Alena Simalatsar and Qi Zhu, "METROII: A Design Environment for Cyber-Physical Systems", *ACM Transactions on Embedded Computing Systems (TECS)*, Vol. 12, No. 49, March, 2013. (author names listed in alphabetical order)
19. Qi Zhu, Haibo Zeng, Wei Zheng, Marco Di Natale and Alberto Sangiovanni-Vincentelli, "Optimization of Task Allocation and Priority Assignment in Hard Real-Time Distributed Systems", *ACM Transactions on Embedded Computing Systems (TECS)*, Vol. 11, No. 4, December, 2012.
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