

Curriculum Vitae

Education

- 2018–pres. **Ph.D. Electrical and Computer Engineering (in progress)**, *University of Michigan*, Ann Arbor.
Advised by Hun-Seok Kim and Ron Dreslinski
- 2015–2018 **M.S. Electrical Engineering**, *University of Washington*, Seattle.
Advised by Visvesh Sathe
- 2011–2015 **B.S. Electrical Engineering**, *University of Washington*, Seattle.
Minor in Mathematics

Research Interests

Hardware and algorithm design for high-performance and energy-efficient computing systems, with an emphasis on critical application domains such as machine learning, computer vision, and next-generation wireless communications.

Peer-Reviewed Publications

Conference Papers

- VLSI'18 **"An All-Digital Unified Clock Frequency and Switched-Capacitor Voltage Regulator for Variation Tolerance in a Sub-Threshold ARM Cortex M0 Processor"**
Fahim U. Rahman, **Sung Kim**, Naveen John, Roshan Kumar, Xi Li, Rajesh Pamula, Keith A. Bowman, and Visvesh Sathe
IEEE Symposium on VLSI Circuits, 2018
- VLSI'18 **"An All-Digital True-Random-Number Generator with Integrated De-correlation and Bias Correction at 3.2-to-86 MB/s, 2.58 PJ/Bit in 65-nm CMOS"**
Rajesh Pamula, Xun Sun, **Sung Kim**, Fahim U. Rahman, Baosen Zhang, and Visvesh Sathe
IEEE Symposium on VLSI Circuits, 2018
- ISSCC'18 **"A Combined All-Digital PLL-Buck Slack Regulation System with Autonomous CCM/DCM Transition Control and 82% Average Voltage Margin Reduction in a 0.6-1.0V Cortex-M0 Processor"**
Xun Sun, **Sung Kim**, Fahim U. Rahman, Rajesh Pamula, Xi Li, Naveen John, and Visvesh Sathe
IEEE International Solid State Circuits Conference, 2018
- DATE'18 **"MATIC: Learning Around Errors for Efficient Low-Voltage Neural Network Accelerators"**
Sung Kim, Patrick Howe, Thierry Moreau, Armin Alaghi, Luis Ceze, and Visvesh Sathe
Design, Automation and Test in Europe, 2018
Best Paper Award
- IISWC'17 **"Exploring Computation-Communication Tradeoffs in Camera Systems"**
Amrita Mazumdar, Thierry Moreau, **Sung Kim**, Meghan Cowan, Armin Alaghi, Luis Ceze, Mark Oskin, and Visvesh Sathe
IEEE International Symposium on Workload Characterization, 2017
- ISC2'15 **"Motion-Vector Clustering for Traffic Speed Estimation from UAV Video"**
Ruimin Ke, **Sung Kim**, Zhibin Li, and Yin Hai Wang
IEEE International Smart Cities Conference, 2015

Journal Papers

- TCAS-I'18 **"Energy-Efficient Neural Network Acceleration in the Presence of Bit-Level Memory Errors"**
Sung Kim, Patrick Howe, Thierry Moreau, Armin Alaghi, Luis Ceze, and Visvesh Sathe
IEEE Transactions on Circuits and Systems - I, 2018

ITS'16 **"Real-Time Bidirectional Traffic Flow Parameter Estimation from Aerial Videos"**

Ruimin Ke, Zhibin Li, **Sung Kim**, John Ash, and Yinhai Wang
IEEE Transactions on Intelligent Transportation Systems, 2016

Workshop Papers

INFOCOM'18 **"Enabling Time-Critical Applications over Next-Generation 802.11 Networks"** (Demo Paper)

Sung Kim, Mohammad Mamunur Rashid, Saurabh Deo, Javier Perez-Ramirez, Mikhail Galeev, Ganesh Venkatesan, Sabyasachi Dey, William Li, Dave A. Cavalcanti
IEEE International Conference on Computer Communications, 2018

Best Demo Award

TRB'16 **"Efficient Vehicle Detection in Aerial Videos Using Combined Cascaded Classifiers and Neural Network Detectors"**

Sung Kim, Ruimin Ke, Zhibin Li, Yinhai Wang
The Transportation Research Board 95th Annual Meeting, 2016

Research and Industry Experience

2017-2018
(8 mo.) **Intel Labs and Altera/PSG**, *Research Intern*, Hillsboro, OR.
◦ Research on baseband signal processing with FPGAs for time-sensitive wireless networking.
With Mamun Rashid and Dave Cavalcanti.

2015-2018 **Processing Systems Lab**, *Graduate Research Assistant*, Seattle, WA.
◦ Research on algorithms and hardware for energy-efficient machine learning.
With Visvesh Sathe.

2016
(5 mo.) **NVIDIA**, *Software Developer Intern*, Santa Clara, CA.
◦ VLSI EDA algorithm development, and investigation into applications of machine-learning for VLSI.
With Vikas Agrawal and Ramesh Sundararaman.

2014
(4 mo.) **Electro Scientific Industries**, *Hardware Developer Intern*, Portland, OR.
◦ Hardware development for industrial manufacturing lasers.

2014 **M.P. Anantram Group**, *Undergraduate Research Assistant*, Seattle, WA.
◦ Software development for simulation of quantum carrier transport.

2013 **UW Photonics Lab**, *Undergraduate Research Assistant*, Seattle, WA.
◦ Software tool development for optical trapping with applications to cell sorting and biological assay.

2011 **InnovaTek**, *Engineering Intern*, Richland, WA.
◦ Hydrogen-reforming catalyst synthesis and characterization.

Recognition

- INFOCOM Best Demo Award, 2018
- DATE Best Paper Award, 2018
- Tau Beta Pi and Eta Kappa Nu, 2013
- Xerox Technical Scholarship, 2012
- Seattle Foundation C.E. Boucher Scholarship, 2011
- University of Washington Dean's List, 2011-2015

Teaching and Service

Reviewer

- *Journal of Signal Processing Systems*, 2018
- *IEEE Transactions on Intelligent Transportation Systems*, 2017

Teaching Assistant, University of Washington.

- Design in Communications with Software-Defined Radio (EE 420), Spring 2018
- Digital VLSI Design I and II (EE 476/477), Winter 2015 and Spring 2016

Students Advised, University of Washington.

- Patrick Howe, B.S.E.E. 2016
FPGA verification and emulation of an OpenMSP430 microcontroller