

Bitarouhani

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Research Interests Large-scale Machine Learning, Deep Learning, Big Data Analysis with Low Dimensional Models, Algorithm Design on Clusters and Emerging Computing Platforms, HW/SW Co-design, Distributed Optimization, Low Power Computing, and Embedded Systems

Education

University of California, San Diego	Jan 2016-Present
<i>Ph.D student, Electrical and Computer Engineering- GPA (4.00/4.00)</i> <i>Advisor: Prof. Farinaz Koushanfar</i>	
Rice University, Houston, TX	Aug 2013-Dec 2015
<i>M.Sc in Electrical and Computer Engineering - GPA (4.12/4.00)</i> <i>Advisor: Prof. Farinaz Koushanfar</i>	
Sharif University of Technology, Tehran	Sep 2009-May 2013
<i>B.Sc in Electrical Engineering- GPA (18.35/20.00)</i>	

Publications

- [1] **B. Rouhani**, A. Mirhoseini, and F. Koushanfar. "Deep³: Leveraging Three Levels of Parallelism for Efficient Deep Learning" In Proceedings of Design Automation Conference (DAC), 2017
- [2] **B. Rouhani**, A. Mirhoseini, and F. Koushanfar. "TinyDL: Just-in-Time Deep Learning Solution for Constrained Embedded Systems" In Proceedings of International Symposium on Circuits & Systems (ISCAS), 2017
- [3] A. Mirhoseini, **B. Rouhani**, E. Songhori and F. Koushanfar. "ExtDict: Extensible Dictionaries for Data- and Platform-Aware Large-Scale Learning" In Proceedings of International Parallel & Distributed Processing Symposium (IPDPS) ParLearning workshop, 2017
- [4] **B. Rouhani**, A. Mirhoseini, and F. Koushanfar. "DeLight: Adding Energy Dimension To Deep Neural Networks" In Proceedings of International Symposium on Low Power Electronics and Design (ISLPED), 2016
- [5] **B. Rouhani**, A. Mirhoseini, E. Songhori, and F. Koushanfar. "Automated Real-Time Analysis of Streaming Big and Dense Data on Reconfigurable Platforms." ACM Transactions on Reconfigurable Technology and Systems (TRETs), 2016
- [6] **B. Rouhani**, A. Mirhoseini, and F. Koushanfar. "Going Deeper than Deep Learning for Massive Data Analytics under Physical Constraints" In proceedings of International Conference on Hardware/Software Co-design and System Synthesis (CODES+ISSS), 2016.
- [7] A. Mirhoseini, **B. Rouhani**, E. Songhori, and F. Koushanfar. "Chime: Checkpointing Long Computations on Intermittently Energized IoT Device." IEEE Transactions on Multi-Scale Computing Systems (TMSCS), 2016
- [8] A. Mirhoseini, **B. Rouhani**, E. Songhori, and F. Koushanfar. "PerformML: Performance Optimized Machine Learning by Platform and Content Aware Customization." In Proceedings of Design Automation Conference (DAC), 2016
- [9] **B. Rouhani**, E. Songhori, A. Mirhoseini, and F. Koushanfar. "SSketch: An Automated Framework for Streaming Sketch-based Analysis of Big Data on FPGA." Field-Programmable Custom Computing Machines (FCCM), 2015
- [10] A. Mirhoseini, E. Songhori, **B. Rouhani**, and F. Koushanfar. "Flexible Transformations For Learning Big Data." Short Paper, ACM Special Interest Group for the Computer Systems Performance Evaluation Conference, (SIGMETRICS), 2015

Preprints	<p>[1] B. Rouhani, M. Ghasemzadeh, and F. Koushanfar. <i>"subject: Streaming-based Real-time Analysis of Causal Bayesian Networks Using FPGA."</i> Under Anonymous Review</p> <p>[2] B. Rouhani, M. Sadegh Riazi, and F. Koushanfar. <i>"subject: Privacy-Preserving Deep Learning."</i> Under Anonymous Review</p>	
Patents	<p>[1] B. Rouhani, M. Ghasemzadeh, and F. Koushanfar. "Automated Scalable Framework for Dynamic Causal Bayesian Learning on FPGA" Under review for US patenting, Application No. 62452880, 2017.</p> <p>[2] B. Rouhani, A. Mirhoseini, and F. Koushanfar. "MobiDeep: Making Sense of Mobile Context by Deep Learning". Under review for US patenting, Application No. 62294215, 2016</p> <p>[3] B. Rouhani, A. Mirhoseini, E. Songhori, and F. Koushanfar. "Automated Real-Time Analysis of Streaming Big and Dense Data" Under review for US patenting, Application No. 62329826, 2016</p>	
Workshop Presentations	<p>[1] "Data- and Platform-Aware Large Scale Machine Learning", Annual Data Science Meet-up, Rice University, 2015</p> <p>[2] "Automated Sketch-based Analysis of Big Data on FPGA", International Conference on Computational Photography (ICCP), 2015</p> <p>[3] "Design and Implementation of Automatic License-Plate Recognition", Best B.Sc. Thesis Award, Sharif University, 2013</p>	
Professional Experiences	<p>Research Intern</p> <ul style="list-style-type: none"> • Microsoft Research, Redmond, WA <ul style="list-style-type: none"> – Sensing and Energy Research Group <p>Graduate Research Assistant</p> <ul style="list-style-type: none"> • University of California, San Diego • Rice University <p>Teaching Assistant</p> <ul style="list-style-type: none"> • University of California, San Diego <ul style="list-style-type: none"> – Security of IoT Systems, Winter 2017 – Advanced Digital Design, Fall 2016 – Security of Hardware Embedded Systems, Spring 2016 • Rice University <ul style="list-style-type: none"> – Advanced Digital Hardware Design, Implementation, and Optimization, Fall 2015 – Design and Analysis of Secure Embedded Systems for IoT era, Spring 2015 • Sharif University <ul style="list-style-type: none"> – Discrete time Signal Processing (DSP), Fall 2012 – Principle of Electrical Engineering, Fall 2012 – Signals and Systems, Fall 2011 – Logic Circuits and Lab, Fall 2011 – Electronic Principles and Lab, Spring 2011 	<p>Summer 2016</p> <p>2013-Present</p> <p>2011-Present</p>
	<p>Lecturer</p> <ul style="list-style-type: none"> • Teaching Physics, Mathematics, and C++ to high school students, Tehran 	<p>2009-2012</p>

Honors and Awards

- **Microsoft Ph.D. Fellowship**, 2017-2019
- **CRA-Women Graduate Cohort Fellowship**, 2016
- **Rice University Honors Student**, GPA: 4.12/4.00
- **DAC Richard Newton Young Student Scholarship**, 2014
- **Electrical and Computer Engineering Department Fellowship**, Rice University, 2013
- **Adaptive Computing and Embedded Systems Lab Fellowship**, Rice University, 2013
- **Exempted from Nationwide M.Sc. Entrance Exam as an Exceptionally Talented Undergraduate**, Sharif University, 2013
- **Best Electrical Engineering B.Sc. Thesis Award**, Sharif University, 2013
- **Ranked 4th among 200+ Electrical Engineering Students**, Sharif University, 2013
- **Ranked 69th among 400,000+ Participants in the Nationwide University Entrance Exam for B.Sc. Degree**, 2009

Computer Skills

- **Programming skill:** C, C++, Python, Verilog (HDL), Java, MATLAB, R
- **Parallel programming:** MPI, OpenMP, OpenCL, CUDA
- **Machine Learning Libraries:** TensorFlow, Theano, Caffe, Keras
- **Design Tools:** Xilinx Design Tools (ISE, Vivado HLS, Vivado), Modelsim, System Generator, Code Composer Studio, Codevision AVR, Hspice, ADS, Altium Protel 99 SE
- **Hardware:** Xilinx Virtex/Spartan FPGAs, WARP

Professional Services

- **President and Executive Committee Member**, Women ExCEL (Electrical and Computer Engineering Leaders), Rice University, 2013-2015
- **Research Project Mentor**, Adaptive Computing and Embedded Systems Lab, Summer 2014-Present

Related Coursework

- Data Mining and Statistical Learning, Algorithms, Parallel Programming, Computational Science, Advanced Digital Hardware Designs, Signals and Systems, Digital Signal Processing, Random Processes, Computer Systems Architecture