

# Zhuoran Zhao

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## SUMMARY

My research interests mainly include efficient runtime/middleware for distributed deep learning, system-level performance modeling and software/hardware co-design.

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## SKILLS

- **Programming languages:** C/C++, Python
- **Tools and frameworks:** LLVM, Caffe2, PyTorch, Darknet, OMNeT++, lwIP.
- Project experiences with operating system kernel programming, multi-threaded programming (POSIX pthreads) and network programming (Socket Programming in C).

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## EDUCATION

- **Ph.D. in Electrical and Computer Engineering;** Dec. 2014 – May 2019  
*University of Texas at Austin;*  
*Advisor: Prof. Andreas Gerstlauer* Austin, Texas
- **M.S. in Electrical and Computer Engineering;** Aug. 2012 – Dec. 2014  
*University of Texas at Austin; GPA: 3.93/4.00* Austin, Texas
- **B.S. in Electrical Engineering;** Sep. 2008 – Jun. 2012  
*Zhejiang University; GPA: 3.95/4.00* Zhejiang, China  
*Honored Minor: Advanced Honor Class of Engineering Education (ACEE)*

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## EXPERIENCE

- **Facebook** Menlo Park, CA  
*Research Scientist*  
*Manager: Neeraj Agrawal*  
Oct. 2019 - Present
  - Ads Machine Learning (ML) Ranking Services: Distributed AI Infrastructure/Ads ML Model Inference
- **University of Texas at Austin** Austin, Texas  
*Graduate Research Assistant/Teaching Assistant* Aug. 2012 - May 2019
  - **DeepThings:** Research project focusing on a portable and lightweight runtime framework for locally distributed CNN/DNN inference in resource-constrained IoT edge clusters, developed in C [1].
  - **Network-of-Systems Simulator (NoSSim):** Research project focusing on a source-level network/system co-simulation framework for distributed embedded/mobile computing cluster prototyping, developed in C++ with LLVM, OMNeT++ and SystemC framework [2].
  - Teaching Assistant: EE382N Embedded System Design and Modeling (Fall 2015), EE319K Introduction to Embedded Systems (Fall 2012)
- **FutureWei Technologies** Plano, Texas  
*Research Intern* May 2014 - Aug. 2014  
*Manager: Weizhong Chen*
  - Architectural Description Language (ADL) framework prototype for digital signal processors (DSP), developed in C++ and Python.
- **NXP Semiconductors** Austin, Texas  
*Research Intern* May 2013 - Aug. 2013  
*Manager: Mark Bader*

- Automatic microprocessor performance calibration framework between RTL and cycle-accurate simulator, developed in C++ with ADL/uADL framework.

- **University of California, Los Angeles**

Los Angeles, California

Summer Exchange Program

Jul. 2011 - Sep. 2011

Advisor: Prof. Vwani P. Roychowdhury

- Interactive complex network visualization in mobile applications and browsers, developed in JavaScript, Java and Python with AJAX technique and Django framework.

## SELECTED PUBLICATIONS

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- [1] Zhuoran Zhao, K. Mirzazad and A. Gerstlauer, **“DeepThings: Distributed Adaptive Deep Learning Inference on Resource-Constrained IoT Edge Clusters,”** *CODES+ISSS, special issue of IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2018.
- [2] Zhuoran Zhao, V. Tsoutsouras, D. Soudris, A. Gerstlauer, **“Network/System Co-Simulation for Design Space Exploration of IoT Applications,”** *Proceedings of the International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation (SAMOS)*, 2017.
- [3] Zhuoran Zhao, A. Gerstlauer and Lizy K. John, **“Source-Level Performance, Energy, Reliability, Power and Thermal (PERPT) Simulation,”** *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2017.
- [4] Zhuoran Zhao, D. Lee and A. Gerstlauer, **“Host-Compiled Reliability Modeling for Fast Estimation of Architectural Vulnerabilities,”** *In Silicon Errors in Logic, System Effects Workshop (SELSE)*, 2015
- [5] S. Chakravarty, Zhuoran Zhao, A. Gerstlauer, **“Automated, Retargetable Back-Annotation for Host-Compiled Performance and Power Modeling,”** *Proceedings of the IEEE/ACM/IFIP International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS)*, 2013.
- [6] L. Guckert, M. O'Connor, S. K. Ravindranath, Zhuoran Zhao and V. J. Reddi, **“A Case for Persistent Caching of Compiled JavaScript Code in Mobile Web Browsers,”** *In Workshop On Architectural And Microarchitectural Support For Binary Translation (AMAS-BT)*, 2013

## RELEVANT GRADUATE COURSEWORK

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- EE382V Dynamic Compilation
- EE382V Advanced Programming Tools
- EE380L Engineering Programming Languages
- EE382C Multicore Computing
- EE382N Computer Architecture
- EE382N Embedded System Design and Modeling
- EE382M System-on-a-Chip Design

## PROFESSIONAL SERVICE

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- **Reviewer:**

- IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 2017
- Design, Automation and Test in Europe (DATE) Conference, 2018
- IEEE/ACM/IFIP International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS), 2018

- **Teaching:**

- Teaching Assistant: EE382N Embedded System Design and Modeling, 2016
- Teaching Assistant: EE319K Introduction to Embedded System, 2012

## HONORS AND AWARDS

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- Best in Session Award for the presentation “Automated, Retargetable Back-Annotation for Host-Compiled Power and Performance Modeling,” in Semiconductor Research Corporation (SRC) TECHCON, Sep 11, 2013
- National Scholarship in China (2%), 2009, 2010