# Zhuoran Zhao

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## Summary


I am a PhD student at the University of Texas at Austin actively seeking full-time position in **Operating System, Compiler** and **Computer Architecture**. My research interests are computer system simulation and performance optimization across full system stack with an emphasis in embedded and mobile domains. More specifically, my research expertise is efficient deployment of computer vision and deep learning algorithms on top of distributed embedded/mobile systems.


## Skills

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

## Education

- **Ph.D. in Electrical and Computer Engineering;** Dec. 2015 – May. 2019
  *University of Texas at Austin;* *Austin, Texas*
  *Advisor: Prof. Andreas Gerstlauer*
- **M.S. in Electrical and Computer Engineering;** Aug. 2012 – May. 2015
  *University of Texas at Austin; GPA: 3.93/4.00* *Austin, Texas*
- **B.S. in Electrical Engineering;** Aug. 2008 – June. 2012
  *Zhejiang University; GPA: 3.95/4.00* *Zhejiang, China*
  *Honored Minor: Advanced Honor Class of Engineering Education (ACEE)*

## Experience

- **University of Texas at Austin** Austin, Texas
  *Graduate Research Assistant* *Jan 2013 - Present*
  - **DeepThings**: A portable and lightweight runtime framework for locally distributed CNN/DNN inference in resource-constrained IoT edge clusters, developed in C [1].
  - **NoSSim**: A source-level network/system co-simulation framework for rapid embedded/mobile system prototyping, developed in C++ with LLVM, OMNeT++ and SystemC framework [2].
  - **HCSim**: A fast full-system simulation platform with abstract models of real-time operating systems (RTOS) and high-level multi-core processor models, developed in C++ with SystemC framework [2].
  - **RBA**: A compile-time profiling and instrumentation tool for source-level system performance evaluation, developed in C++ and python with gcc and LLVM framework [3].
- **FutureWei Technologies** Plano, Texas
  *Research Intern* *Jun 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* *Jun 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** Austin, Texas
  *Research Intern* *Jun 2011 - Aug 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

[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

- 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

- **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

- 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