

# Zhuoran Zhao

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## SUMMARY

My research interest is in the area of electronic system-level (ESL) design and modeling, mainly including 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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## FULL-TIME EXPERIENCE

- **Facebook** Menlo Park, CA  
*Research Scientist* *Oct. 2019 - Present*
  - Ads Machine Learning (ML) Ranking Infrastructure: Tech Lead on Ads ML Serving Infra PyTorch enablement and massive adoption
  - PyTorch: PyTorch inference runtime and compiler
- **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 [2].
  - **Network-of-Systems Simulator (NoSDSE):** 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 [1].
  - Teaching Assistant: EE382N Embedded System Design and Modeling (Fall 2015), EE319K Introduction to Embedded Systems (Fall 2012)

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## SELECTED PUBLICATIONS

- [1] Zhuoran Zhao, K. Mirzazad and A. Gerstlauer, “**Network-level Design Space Exploration of Resource-constrained Networks-of-Systems,**” *ACM Transactions on Embedded Computing Systems (TECS)*, 2020.
- [2] 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.

- [3] 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.
- [4] 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.
- [5] 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
- [6] 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.
- [7] 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

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## PROFESSIONAL SERVICE

- **Technical Program Committee (TPC) Member:**
  - Design Automation Conference (DAC) 2021 (Session manuscript reviewer)
  - Design Automation Conference (DAC) 2022, 2023 (Session manuscript reviewer and presentation co-chair)
- **Reviewer:**
  - IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)
  - IEEE Transactions on Parallel and Distributed Systems (TPDS)
  - IEEE Internet of Things Journal (IoT-J)
  - 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

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## 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