

Yuhao Zhu

CONTACT INFORMATION

Assistant Professor, Computer Science
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RESEARCH INTERESTS

My research interests are computer architecture and software design to enable next-generation mobile systems that are energy-efficient, intelligent, and offer desirable end-user experience. To that end, my recent work focuses on domain-specific systems for visual computing and Web technologies.

In my [dissertation work](#), I designed and prototyped systems that address the fundamental trade-off between energy-efficiency and user QoS experience in mobile Web computing via architecture, runtime, and programming language co-design.

EDUCATION

The University of Texas at Austin

Ph.D., Electrical and Computer Engineering *September 2016 (conferred May 2017)*
M.S.E.E., Electrical and Computer Engineering *May 2015*
Advisor: [Vijay Janapa Reddi](#)
Dissertation: [Energy-Efficient Mobile Web Computing](#)

Beihang University, Beijing, China

B.S., Computer Science and Engineering *June 2010*
Advisor: [Yangdong Deng](#)

HONORS & RECOGNITIONS

- Google Ph.D. Fellowship, 2016
- IEEE Micro Top Picks of Computer Architecture (Honorable Mention), 2016
- Qualcomm Innovation Fellowship Finalist, 2015
- Best of Computer Architecture Letters Award, 2014
- UT Austin Microelectronics and Computer Development Fellowship, 2011-2012
- Outstanding Undergraduate Thesis Award, Beihang University, 2010

PROFESSIONAL POSITIONS

University of Rochester

Assistant Professor, Computer Science Department 2017 -

ARM Research

Visiting Researcher July 2017 - Dec 2017

Harvard University

Research Fellow Aug 2016 - May 2017

The University of Texas at Austin

Graduate Researcher Aug 2010 - May 2017

Teaching Assistant Fall 2010, Spring 2011, Spring 2014

Google Inc.

SWE Intern (Lead of [Flow API](#) of the [Catapult](#) project) Summer 2015

AMD Research Lab
Research Intern

Summer 2012, Summer 2013

STMicroelectronics
Co-op Engineer

Summer 2011

Tsinghua University
Undergraduate Researcher

June 2009 - May 2010

PUBLICATIONS **Invited Articles**

- [Yuhao Zhu](#), Vijay Janapa Reddi, Robert Adolf, Saketh Rama, Brandon Reagen, Gu-Yeon Wei, David M. Brooks
[Cognitive Computing Safety: The New Horizon for Reliability / The Design and Evolution of Deep Learning Workloads](#)
IEEE Micro Special Issue on Cognitive Architectures, Jan/Feb 2017, 37(1):15-21
- Peter Bailis, Jean Yang, Vijay Janapa Reddi, [Yuhao Zhu](#)
[Research for Practice: Web Security and Mobile Web Computing \(Website\)](#)
Communications of the ACM (CACM), Jan 2017, 60(1): 50-53
Also appears in *ACM Queue*, July/Aug 2016, 14(4):80-95.

Journal Articles

- [Yuhao Zhu](#), Vijay Janapa Reddi
[Optimizing General-Purpose CPUs for Energy-Efficient Mobile Web Computing](#)
ACM Transactions on Computer Systems (TOCS), March 2017, 35(1):1
- [Yuhao Zhu](#), Matthew Halpern, Vijay Janapa Reddi
[The Role of the CPU in Energy-Efficient Mobile Web Browsing](#)
IEEE Micro Special Issue on Mobile Systems, Jan/Feb 2015, 35(1):26-33
- [Yuhao Zhu](#), Aditya Srikanth, Jingwen Leng, Vijay Janapa Reddi
[Exploiting Webpage Characteristics for Energy-Efficient Mobile Web Browsing](#)
Computer Architecture Letters (CAL), Oct 2012, 13(1):33-36
Awarded Best of Computer Architecture Letter in 2014
- [Yuhao Zhu](#), Bo Wang, Yangdong Deng
[Massively Parallel Logic Simulation with GPUs](#)
ACM Transactions on Design Automation of Electronic Systems (TODAES), June 2011, 16(3):29

Conference Papers

- [Yuhao Zhu](#), Vijay Janapa Reddi
[GreenWeb: Language Extensions for Energy-Efficient Mobile Web Computing](#)
PLDI 2016
- Matthew Halpern, [Yuhao Zhu](#), Vijay Janapa Reddi
[Mobile CPU's Rise to Power: Quantifying the Impact of Generational Mobile CPU Design Trends on Performance, Energy, and User Satisfaction](#)
HPCA 2016
- [Yuhao Zhu](#), Daniel Richins, Matthew Halpern, Vijay Janapa Reddi
[Microarchitectural Implications of Event-driven Server-side Web Applications](#)
MICRO 2015
IEEE Micro Top Picks of Computer Architecture (Honorable Mention) in 2016

- [Yuhao Zhu](#), Matthew Halpern, Vijay Janapa Reddi
[Event-based Scheduling for Energy-Efficient QoS \(eQoS\) in Mobile Web Applications](#)
HPCA 2015
- Matthew Halpern, [Yuhao Zhu](#), Ramesh Peri, Vijay Janapa Reddi
[Mosaic: Cross-Platform User-Interaction Record and Replay Tool for the Fragmented Android Ecosystem](#)
ISPASS 2015
- [Yuhao Zhu](#), Vijay Janapa Reddi
[WebCore: Architectural Support for Mobile Web Browsing](#)
ISCA 2014
- Chen Zhou, Xiaofei Wang, Weichao Xu, [Yuhao Zhu](#), Vijay Janapa Reddi, Chris Kim
[Estimation of Instantaneous Frequency Fluctuation in a Fast DVFS Environment Using an Empirical BTI Stress-Relaxation Model](#)
IRPS 2014
- [Yuhao Zhu](#), Vijay Janapa Reddi
[High-Performance and Energy-Efficient Mobile Web Browsing on Big/Little Systems](#)
HPCA 2013
- [Yuhao Zhu](#), Yangdong Deng, Yubei Chen
[Hermes: An Integrated CPU/GPU Microarchitecture for IP Routing](#)
DAC 2011
- Bo Wang, [Yuhao Zhu](#), Yangdong Deng
[Distributed Time, Conservative Parallel Logic Simulation on GPUs](#)
DAC 2010

Book Chapters

- Yangdong Deng, [Yuhao Zhu](#), Bo Wang
[Asynchronous Parallel Logic Simulation on Modern Graphics Processors](#)
GPU Solutions to Multi-scale Problems in Science and Engineering, 2013
- Yangdong Deng, Xiaomeng Jiao, Shuai Mu, Kang Kang, [Yuhao Zhu](#)
[NPGPU: Network Processing on Graphics Processing Units](#)
Theoretical and Mathematical Foundations of Computer Science, 2011

ACADEMIC TALKS

- **The Watt Wise Web**
Texas A&M University, Jan 2017, Teleseminar
Boston Area Architecture Workshop (BARC), Jan 2017, Cambridge, MA
ARM Research, Jan 2017, Austin, TX
UT Austin School of Information, Feb 2017, Austin, TX
- [GreenWeb: Language Extensions for Energy-Efficient Mobile Web Computing](#)
PLDI 2016, June 2016, Santa Barbara, CA
- [The Human Processing Unit \(HPU\) as a New Approximate Computing Substrate](#)
WAX 2016 co-located with ASPLOS 2016, April 2016, Atlanta, GA
- [Scalable End-to-end Quality Control in Approximate Computing](#)
WAX 2016 co-located with ASPLOS 2016, April 2016, Atlanta, GA

- [Microarchitectural Implications of Event-driven Server-side Web Applications](#)
MICRO 2015, December 2015, Waikiki, HI ([lightening version](#))
- [Exploiting Webpage Characteristics for Energy-Efficient Mobile Web Browsing](#)
Best of CAL 2014 presented at HPCA 2015, February 2015, San Francisco, CA
- [Event-Based Scheduling for Energy-Efficient QoS \(eQoS\) in Mobile Web Applications](#)
HPCA 2015, February 2015, San Francisco, CA
- [WebCore: Architectural Support for Mobile Web Browsing](#)
ISCA 2014, June 2014, Minneapolis, MN ([lightening version](#))
Intel invited talk, July 2014, Austin, TX
- [High-Performance and EnergyEfficient Mobile Web Browsing on Big/Little Systems](#)
HPCA 2013, February 2013, Shenzhen, China
UT Austin Programming Language Lunch Seminar, September 2012, Austin, TX
AMD Research Lab, August 2012, Austin, TX
- [Hermes: An Integrated CPU/GPU Microarchitecture for IP Routing](#)
DAC 2011, June 2011, San Diego, CA

SOFTWARE ARTIFACTS

GreenWeb (<https://codereview.chromium.org/1835303002/>)

- Language and runtime for energy-efficient mobile Web.

AutoGreen (<https://github.com/yuhao/AutoGreen>)

- Framework to annotate Web applications with GreenWeb language extensions.

Node Benchmark (<https://github.com/nodebenchmark/benchmarks>)

- Node.js-based event-driven server workload suite.

Domino.js (<https://github.com/yuhao/domino.js>)

- DOM instrumentation and optimization framework.

SERVICES

Program Committee

- [HPCA 2018](#): External Reviewer Committee
- [ISCA 2017](#): External Reviewer Committee
- [HCOMP 2016](#): Program Committee
- [CGO-PPoPP 2015, 2016](#): Artifacts Evaluation Committee
- [TinyToCS](#) Volume III: Program Committee

Organizing Committee

- Co-organizer: [Cognitive Edge Computing](#) Workshop co-located with MICRO 2017
- Co-chair: [Sensors to Cloud Architectures](#) Workshop co-located with HPCA 2017
- Web chair: [Cognitive Edge Computing](#) Workshop co-located with MICRO 2016
- Co-organizer: [MobiTools](#) Workshop co-located with ISCA 2016
- Program Chair: [TinyToCS](#) Volume IV

Solicited Reviewer

- [IEEE Micro](#) (2017), [TACO](#) (2016), [ESL](#) (2015), [DAC](#) (2011, 2012), [TODAES](#) (2011)

Women in Engineering Program (WEP) (<http://www.engr.utexas.edu/wep>)

- Speaker at high school-focused summer camps at UT Austin with an emphasis on inspiring high school female about engineering (~75 high school senior women)
- Mentored two female sophomores in the Graduates Linked with Undergraduates in Engineering (GLUE) Program.

**TEACHING
EXPERIENCE**

Teaching Assistant

- Introduction to Embedded Systems, with Prof. Jonathan W. Valvano
- Computer Architecture, with Prof. Yale N. Patt
- Dynamic Compilation, with Prof. Vijay Janapa Reddi

MENTORING

- Hannah Peeler, Undergraduate student at UT Austin, 2016
- Janna Tulabot, Undergraduate student at UT Austin, 2016
- Matthew Halpern, Ph.D. student at UT Austin, 2013 - 2017
- Wenzhi Cui, Ph.D. student at UT Austin, 2015 - 2017