

Yuhao Zhu

CONTACT INFORMATION

Assistant Professor, Computer Science
University of Rochester
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Rochester, NY 14627

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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 has focused on domain-specific systems architecture for continuous vision, Virtual Reality, and Web technologies.

EDUCATION

The University of Texas at Austin

Ph.D., Electrical and Computer Engineering

May 2017

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

- SIGARCH/TCCA Outstanding Dissertation Award, Honorable Mention, 2018
- Google Faculty Research Award, 2017
- 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, Department of Computer Science
Affiliated Faculty, Goergen Institute for Data Science

Jan. 2018 - now

June 2018 - now

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](#), Anand Samajdar, Matthew Mattina, Paul Whatmough
[Euphrates: Algorithm-SoC Co-Design for Low-Power Mobile Continuous Vision](#)
ISCA 2018
- Yuwei Hu, Jidong Zhai, Dinghua Li, Yifan Gong, [Yuhao Zhu](#), Wei Liu, Lei Su, Jiangming Jin
[BitFlow: Exploiting Vector Parallelism for Binary Neural Networks on CPU](#)
IPDPS 2018
- [Yuhao Zhu](#), Matthew Mattina, Paul Whatmough
[Mobile Machine Learning Hardware at ARM: A Systems-on-Chip \(SoC\) Perspective](#)
SysML 2018
- [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**

- **Energy-Efficient Mobile Web: Proactive and Reactive Perspectives**
Google, April 2018, Seattle, WA

- **Algorithm-SoC Co-design for Energy-Efficient Mobile Continuous Vision**
Cornell University, Feb 2018, Ithaca, NY
CogArch Workshop co-located with ASPLOS 2018, March 2018, Williamsburg, VA
SRI International, April 2018, Princeton, NJ
ISCA 2018, June 2018, Los Angeles, CA
- **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
- **Energy and Power Measurement on Mobile Devices**
MobiTools co-located with ISCA 2016, June 2016, Seoul, Korea
- **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 (lightning 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 (lightning 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

SCALE-Sim (<https://github.com/ARM-software/SCALE-Sim>)

- Systolic CNN AcceLErator Simulator.

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 2019**: 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

- **ICS** (2018), **IEEE CAL** (2018), **IEEE TMC** (2017), **IEEE Micro** (2018, 2017), **ACM TACO** (2016), **IEEE ESL** (2015), **DAC** (2012, 2011), **ACM 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

Instructor (University of Rochester)

- Spring 2018, Computer Organization

Teaching Assistant (UT Austin)

- Fall 2010, Introduction to Embedded Systems, with Jonathan W. Valvano
- Spring 2011, Computer Architecture, with Yale N. Patt
- Spring 2013, Dynamic Compilation, with Vijay Janapa Reddi

MENTORING

University of Rochester

Ph.D.:

- Yu Feng (MS: Carnegie Mellon Univ.)
- Yiming Gan (MS: UC Santa Barbara)

MS:

- Chi-chun Chen (BS: National Taiwan Univ.)

Undergraduate:

- Tolga Furkan Aktas
- Noah Helterbrand
- Prikshet Sharma
- Qiuyue Sun

Alumni:

- **Undergraduate:** Oliver Zhang (Univ. of Michigan)
- **Undergraduate:** Abdullah Al Mamun (Yale Univ.)

Previously at UT Austin

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