Josh Fromm

CONTACT
INFORMATION

2510B NE 65th St
Seattle, WA 98115

Mobile: +1-626-676-2684
E-mail: jwfromm@uw.edu
Website: jwfromm.com

RESEARCH
STATEMENT

I am a fifth year PhD Student at the University of Washington advised by Shwetak Patel in the **Ubiquitous Computing Lab**. My research focuses on (1) Developing **novel approximating algorithms** for neural networks, (2) building systems that enable **efficient execution on embedded platforms**, and (3) exploring applications of **computer vision in resource constrained environments**.

EDUCATION

University of Washington, Seattle, WA
Pursuing a Ph.D in Electrical Engineering as part of the UbiComp Lab.   **2014 - 2019**.
California Institute of Technology, Pasadena, CA
Bachelor of Science with Honors in Electrical Engineering   **June 2014**
and Computer Science.

EXPERIENCE

Graduate Student   **2014 to present**
UbiComp Lab   **Research Assistant**
  Researching novel applications and architectures for deep neural networks, with an emphasis on high performance computer vision systems.
Google Nest   **2018**
Nest Brain Team   **Research Intern**
  Developed novel generative adversarial network training techniques to enable realistic colorization of IR images captured by Nest Cams.
Microsoft Research   **2016 and 2017**
Machine Learning on the Edge Group   **Research Intern**
  Explored neural network binarization as a method for enabling deep convolutional neural network inference on Raspberry Pi class devices. Developed novel binarization algorithms to allow fine-grained tuning of speed and accuracy tradeoff.
Microsoft Research Cambridge   **2015**
Sensors and Devices Team   **Research Intern**
  Developed RF power harvesting techniques and hardware as part of the NEXT initiative to create novel interaction technology.
Nvidia Corporation   **2013 and 2014**
GPU Verification Division   **ASIC Engineer**
  Verified that streaming multiprocessor operation in RTL matched simulated outputs using a C++ model.
NASA Jet Propulsion Laboratory
Chris Assad Lab, Robotics Division   **SURF Fellow 2012**
  Designed and developed EMG electrode system that allows control of a robotic arm through muscle activity.

CONFERENCE
PUBLICATIONS

Fromm J, Patel S, Phillipose M. Heterogeneous Bitwidth Binarization in Convolutional Neural Networks. In: NeurIPS, 2018.

Moreau T, Chen T, Fromm J, et al. YOGI: Flexible Architecture & Runtime Co-Design for Deep Learning Specialization. In: ISCA 2018.

Saba E, Fromm J, Jiayao C, Patel S. TB or not TB: Cough Detection and Tuberculosis Classification for Pulmonary Health Estimation. In: IMWUT, 2018.

Hwan Ko J, Fromm J, Phillipose M, Tashev I, Zarar S. Liming Numerical Precision of Neural Networks to Achieve Real-Time Voice Activity Detection. In: ICASSP, 2018.

Li H, Brockmeyer E, Carter E, Fromm J, Hudson S, Patel S, Sample A. PaperID: A Technique for Drawing Functional Battery-Free Wireless Interfaces on Paper. In: CHI, 2016.

Grosse-Puppendahl T et al. Exploring the Design Space for Energy-Harvesting Situated Displays. In: UIST 2016.

Goel M, Saba E, Stiber M, Whitmire E, Fromm J, Larson E, Borriello G, Patel S. SpiroCall: Measuring Lung Function over a Phone Call. In: CHI, 2016.

Wolf M, Assad C, Vernacchia M, Fromm J, Jethani H. Gesture-Based Robot Control with Variable Autonomy from the JPL BioSleeve. In: IEEE Conference on Robotics and Automation (ICRA), 2013.

HONORS AND AWARDS		
Microsoft Research Graduate Fellow		**2017**
NSF Graduate Research Fellowship Honorable Mention		**2016**
Google IOT Research Award Recipient		**2016**
Amazon Catalyst Fellow		**2016**
Qualcomm Innovation Fellowship Finalist		**2015**
Caltech Bachelors of Science with Honors		**2014**
Caltech Uppper Class Merit Award		**2013**
Richter Scholar Fellow		**2011**
Lincoln Southeast High School Valedictorian		**2010**

TEACHING EXPERIENCE

GIX TECHIN 513: Managing Data and Signal Processing   **Instructor 2017-2019**
Developed and taught an introduction to practical deep learning with a data and application driven focus. The course teaches students how to create an end to end deep learning system with their own data and deploy it efficiently on custom hardware or in the cloud.

UW EE 478: Embedded Systems Capstone   **Instructor 2015**
Developed and taught a course for seneior embedded design students meant to emulate an industry experience. In the course, teams of students propsed, designed, and built a custom embedded system from scratch and had to deliver on predtermined milestones.

UW EE 472: Embedded Microcomputer Systems   **TA 2015**
Redesigned the curriculum of an intro to embedded systems course to focus on creating a cohesive "RoboTank" mobile robotic platform from scratch over the quarter.

Caltech EE/CS 51: Embedded Systems Software Design Laboratory   **TA 2012-2014**
Intro to embedded systems that focuses on developing efficient firmware in assembly. Primary skills developed in this course are careful planning, system design, and most importantly debugging.

Caltech EE/CS 52: Embedded Systems Software Design Laboratory   **TA 2012-2014**
Embedded systems hardware course in which students develop a voice over IP phone from scratch using both custom hardware and software (assembly).

Caltech EE/CS 53: Microprocessor Project Laboratory   **TA 2013-2014**
Advanced embedded systems course in which students propose and develop a project of their choosing.

REFERENCES

Shwetak Patel	Steve Hodges
Professor and Director of the Ubicomp Lab	Senior Researcher
Computer Science & Electrical Engineering	Sensors and Devices Team
University of Washington	Microsoft Research Cambridge
shwetak@cs.washington.edu	steve.hodges@microsoft.com
Luis Ceze	Matthai Philipose
Professor and Director of the SAMPA Lab	Senior Researcher
Computer Science	Mobility and Networking Group
University of Washington	Microsoft Research
luisceze@cs.washington.edu	matthaip@microsoft.com