Josh Fromm

Contact Information

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Education

University of Washington, Seattle, WA
Pursuing a Ph.D in Electrical Engineering as part of the UbiComp Lab. **2014 - 2019**
Focusing on developing novel hardware solutions to problems ranging from interaction to implanted health sensing.

California Institute of Technology, Pasadena, CA
Bachelor of Science with Honors in Electrical Engineering **June 2014**
with a Minor in Computer Science.
Emphasis on embedded system and low level software development along with VLSI and FPGA systems.

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 Cambridge **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**
Worked as a member of the NEXT initiative developing novel interaction technology with a focus on producing high impact results in a real product. My contribution involved low level system development along with exploratory power harvesting research and design.

Nvidia Corporation **2013 and 2014**
GPU Verification Division **ASIC Engineer**
Verified that streaming multiprocessor operation in RTL matched simulated outputs using a C++ model. Also developed a software framework that allows increased automation in bug detection and filing.

NASA Jet Propulsion Laboratory
Chris Assad Lab, Robotics Division **SURF Fellow 2012**
Designed and developed the hardware and software of a system that uses an array of EMG electrodes to monitor muscle activity in a user's arm, classify the raw data using support vector algorithms, and control any of several robotic interfaces using simple trained gestures.
Continued Work in Robotics Division **Independent Researcher 2013**
Developed an embedded system device capable of mimicking the functionality of the original, much more cumbersome and power inefficient, BioSleeve.

California Institute of Technology
Guillaume Blanquart Lab, Department of Mechanical Engineering **Richter Scholar 2011**
Studied the simulation of multiphase flow using distinct materials. Developed novel simulation methods and algorithms to obtain results that better agree with physical observations.

Conference Publications

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

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..