

## **EDUCATION:**

### **University of British Columbia, Vancouver, BC**

#### **Masters of Applied Science – Electrical and Computer Engineering**, Expected June 2018

- GPA: 86.5%
- Course Highlights – Advanced Computer Architecture; Algorithms that Matter; CAD Algorithms; Machine Learning; Parallel Computing; Big Data Systems
- Thesis research currently focused on accelerating Deep Neural Networks.

### **University of Washington, Seattle, WA**

#### **Bachelor of Science – Electrical Engineering - Embedded Computing**, June 2016

- Major GPA: 3.66; Overall GPA: 3.46
- Course Highlights –Computer Networks; Network Security and Cryptography; Microcomputer Systems; Programming Concepts and Tools; Computer Design Organization; Digital circuits and Systems

## **RESEARCH INTERESTS:**

- Hardware accelerators and Field programmable gate arrays
- Machine Learning – Deep neural networks (DNN)
- Computer security

## **RELEVANT PROJECTS:**

### **Continuous Pruning: DNN Training on a Shoestring Budget**

(Graduate Research Project supervised by Prof. Mieszko Lis and Prof. Guy Lemieux; Spring 2017-Present)

- Developed several algorithms for reducing the number of parameters updated during neural network training.
- Enabled the training of the VGG-16 DNN with 5x less memory at the same accuracy.
- Enabled the training of Alexnet using 10x less memory for the same accuracy.
- Larger networks such as Googlenet and seq2seq currently being studied.

### **Pushing Fail-Stop Recovery into the Network for Disaggregated Datacenters**

(Research Project for Parallel Computing Final; Fall 2016)

- Design for SDN managed failure recovery in a disaggregated datacenter.
- Reduces number of failures an application programmer must consider.

### **A Comparative Study of Data Parallel vs. Pipelined Image Processing**

(Research Project for Big Data Systems Final; Fall 2016)

- Compared a data parallel image processing design to a pipelined image processing design
- Found that both methods of parallel execution perform similarly on in memory data, and pipeline parallelism is 15% faster on average when accessing on disk data

### **Data Acquisition System for The RD53 Emulator**

(Research project supervised by Prof. Scott Hauck and Prof. Shih-Chieh Hsu; Spring 2015-Spring 2016)

- FPGA based control system for an emulated particle sensor
- Programmed in Verilog and Python

### **Data Acquisition System for Prototype Pixel Sensor – T3MAPS**

(Research project supervised by Prof. Scott Hauck and Prof. Shih-Chieh Hsu; Fall 2014-Spring 2015)

- FPGA based control system for a prototype particle sensor
- Based on the open source Basil Digital Acquisition firmware
- Programmed in Verilog and Python

### **Pipelined MIPS CPU**

(Computer Design Organization Final Project; Fall 2015)

- Designed a reduced instruction set pipelined MIPS CPU

- Designed a custom 32 bit Kogge-Stone adder for use in the arithmetic logic unit
- Constructed with gate level Verilog through the entire datapath

## **RESEARCH EXPERIENCE:**

**Graduate Research Assistant**, September 2016 - Present

Department of Electrical and Computer Engineering, University of British Columbia

- Researching DNN acceleration on FPGAs and ASICs.
- Developing algorithms to reduce memory usage during DNN training.

**Undergraduate Research Assistant**, April 2013 – June 2016

Department of Electrical Engineering and Department of Physics, University of Washington

- Assisted development of open source Basil Digital Acquisition framework.
- Led development of several digital acquisition systems for prototype pixel sensors.

## **RELATED WORK EXPERIENCE:**

**Lead Engineering Intern**, Silicon Mechanics; April 2014 – Present

- Designed and programmed low level stress testing software for server components. (Python, CUDA)
- Designed and programmed novel automation suite. (Python, RethinkDB)
- Rapid research and development on customer requests.
- Selected and interview candidates for the Silicon Mechanics engineering team.
- Presented teams product to multi-billion dollar company.

## **LEADERSHIP AND VOLUNTEER EXPERIENCE:**

**Volunteer**, QuarkNet, University of Washington; February 2013

- Assisted High school students and teachers with a QuarkNet physics workshop.

## **HONORS AND AWARDS:**

- GSI Scholarship, Department of Electrical and Computer Engineering, University of British Columbia, January 2018
- Summer Undergraduate Research Program, Washington NASA Space Grant Consortium, University of Washington, June 2015
- Best Presenter, US ATLAS Physics Workshop, University of Washington, March 2014
- Honorable Mention at Hack the Commute Seattle, City of Seattle, March 2015

## **AFFILIATIONS:**

**Lawrence Berkley National Laboratory**, June 2015 – August 2015

**European Organization for Nuclear Research (CERN)**, September 2013 – September 2014

## **PRESENTATIONS AND POSTERS:**

US ATLAS Physics Workshop, University of Washington, March 2014

17th Annual UW Undergraduate Research Symposium, University of Washington, May 2014

18th Annual UW Undergraduate Research Symposium, University of Washington, May 2015

19th Annual UW Undergraduate Research Symposium, University of Washington, May 2016

NASA Space Grant Poster Session, University of Washington, September 2015