Lawson Fulton

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lawsonfulton.com - github.com/zero-impact

EDUCATION

University of Toronto September 2017 – January 2019

Candidate M.Sc, Computer Science (Research Stream) – *Machine Learning, Computer Graphics*

University of Waterloo September 2010 – April 2015

B.Math, Honours Computer Science – Co-op (With Distinction)

EXPERIENCE

MESH Inc. - *Geometry Studio and Consultancy* **August 2018 - present**

Student Intern - Computational Design Toronto, ON

- Leading project to develop new algorithms for the design of lattice-based metamaterials for 3D printing.
- Reviewing relevant literature, implementing, and extending geometry-processing algorithms in C++.
- Interfacing with clients to develop and deliver novel solutions to computational design challenges of all kinds.

University of Toronto - *Department of Computer Science* **July 2017 - present**

Research Master's Student (Advised by Alec Jacobson and David I.W. Levin) Toronto, ON

- Conducting research on the use of machine learning to accelerate physical simulation.
- Integrating Tensorflow models trained in Python framework with real-time C++ applications.
- Communicating my research results in publications, talks, and posters.
- President of the Computer Science Graduate Student Union: Representing students to department, managing other union execs, coordinating events, and workshops to foster student growth.

Best Poster - Graphics Interface 2018: Lawson Fulton, Vismay Modi, David Duvenaud, David I.W. Levin, and Alec Jacobson. 2018. Autodef: Non-linear Subspace Simulation for Large Deformation Elastodynamics.

Dropbox - *Teams Platform* **August 2015 - April 2017**

Software Engineer San Francisco, CA

- Developed features and experiments for Dropbox Teams within a massive codebase using Dropbox's custom Python backend and Typescript/Coffeescript with React/Flux/HTML/CSS on the front.
- Collaborated with PMs and designers to write and refine feature and experiment specs before and during the development process.
- Ensured the reliability of all new features with extensive unit and selenium testing.
- Owned the functionality and reliability for the groups feature of Dropbox Teams.
- Participated in the daily push on-call rotation, ensuring Dropbox keeps running on fresh code every day.

Autodesk Research - *Bio/Nano/Programmable Matter Group* **April 2014 - December 2014**

Software Developer Intern San Francisco, CA

- Led the design and implementation of a replacement for the deprecated Autodesk 123D plugin for 3D modelling in the browser using Javascript and WebGL.
- Created a Javascript webapp for doing 3D/Bio Printing on Cyborg, our platform for app development.
- Designed and implemented a security solution for isolation of arbitrary user-written Python code using

Docker Linux Containers.
- Coordinated with external universities and companies to define future research efforts and collaborations.

LinkedIn - *Data Analytics Infrastructure Team* **August 2013 - December 2013**
Software Engineer Intern Mountain View, CA

- Reduced request latency by 50% through research and implementation of bitmap-based columnar database indexes within an in-house developed database with Java.
- Performed extensive analysis and comparisons of different indexing techniques using R and Java, resulting in accurate predictions of real world performance.

Autodesk Research - *High Performance Computing Group* **January 2013 - May 2013**
Research Software Developer Shanghai, China

- Improved the design and performance of distributed computing platform, built during previous internship (See April 2012), through collaboration and on-ramping of new Shanghai team members.
- Acted as coordinator between Toronto and Shanghai teams, and ultimately bringing the project to a higher level of exposure inside the organization by showcasing our work to multiple teams.
- Redesigned a serial Python mathematical optimization package to run on our distributed platform.
- Took on the responsibility of a research sub-project involving the use of genetic evolutionary algorithms to explore applications of design optimization in the cloud.
- Created documentation and getting-started guides for developers and users of the platform.

University of Waterloo - *Center for Theoretical Neuroscience* **May 2013 - August 2013**
Research Assistant - Computational Neuroscience Group Waterloo, ON

Autodesk Research - *High Performance Computing Group* **April 2012 - August 2012**
Software Developer Toronto, ON

- Built, and assisted in the design of, a prototype distributed computing platform for running and dynamically scaling massively parallel mathematical optimization algorithms. Made with Python, Amazon Web Services (EC2, SQS, S3), and Redis.
- Collaborated with internal and external clients to satisfy their cloud computing needs while improving the cloud-platform prototype.
- Implemented and applied distributed optimization algorithms such as Differential Evolution in Python.

Autodesk Research - *Research Transfer Group* **April 2011 - August 2011**
Software Developer Toronto, ON

- Finished the design and implementation of a new, and more programmer-friendly, C++ API for the Nucleus physics engine for computer animation.
- Created many interactive physics demos using the new API built with C++, QT, and OpenGL.
- Developed a Python wrapper for the API using SWIG and samples with PyOpenGL.
- Prepared technical documentation for the Nucleus API along with a getting-started guide.

TECHNICAL SKILLS

- Languages: **Python, C++, Java/Type/Coffeescript, HTML/CSS, Java, MATLAB, R, Scheme**
- Graphics: **libigl, OpenGL**, **Blender, OnShape, Processing, openFrameworks, 3D Printing**
- Machine Learning: **Tensorflow, Keras, Math (Bayesian Statistics, Linear Algebra, Calculus)**
- Amazon Web Services: **Boto, EC2, SQS, S3**
- Revision Control: **Git/Github, Perforce, Phabricator**
- Other Technologies: **React, Flux, Docker, Redis, Selenium, SQL, OpenCL, SWIG, QT, NumPy**