

Education

- Massachusetts Institute of Technology**, Cambridge, MA 2014 – June 2017 (expected)
B.S., Computer Science Major GPA: 5.0/5.0
Graduate / Advanced Algorithms (6.854/6.046), Graduate / Advanced Performance Engineering for Multicore Systems (6.886/6.172), Graduate Algorithmic Lower Bounds (6.890), Circuits and Electronics (6.002)
- B.S., Physics* Major GPA: 5.0/5.0
Graduate Quantum Computation (8.370), Graduate / Advanced Algorithms (6.854/6.046), Graduate General Relativity (8.962), Quantum Mechanics I/II/III (8.04/8.05/8.06), Statistical Mechanics (8.044)
- Thomas Jefferson High School for Science and Technology**, Alexandria, VA 2010 – 2014
Concentration in Optics & Modern Physics GPA: 4.5/4.0
Artificial Intelligence, Parallel Computing, Quantum Physics/Electrodynamics, Computational Physics

Professional Experience

- Harvard & MIT Computational Connectomics Group**, Cambridge, MA May 2016 – present
Researcher
- Project designed to use machine learning algorithms to determine the connectome or connections between neurons of a cubic millimeter of brain and use this information to design better artificial neural networks.
 - Performance-engineering of neural network to identify neurons and develop the effectiveness of the skeletonization code.
- Supervisor: Dr. Charles Leiserson
- Space Exploration Technologies (SpaceX)**, Hawthorne, CA June 2015 – May 2016
Software / Propulsion Engineering Intern
- Development of advanced multiphysics simulation using Wavelet Compression and GPU's/CUDA.
 - Redesign of core algorithms (e.g. distributed wavelet transform) for scalability and run on Titan supercomputer
- Supervisors: Dr. Adam Lichtl, Stephen Jones
- MIT Computer Science and Artificial Intelligence Laboratory**, Cambridge, MA Sept 2014 – present
Researcher
- Development of extension to LLVM IR to efficiently represent and optimize parallel.
 - Development of new serial and parallel-specific optimizations for parallel code.
- Supervisor: Dr. Charles Leiserson
- U.S. Naval Research Laboratory**, Washington, DC June 2013 – Aug 2014
Electrical Engineering Intern
- Conducted research into data transfer efficiency in the wireless spectrum.
 - Creation of machine-learning algorithm to identify gaps in wireless spectrum and increase bandwidth and resilience of signals
- Supervisor: Dr. Andrew Robertson
- Hume Center for National Security and Technology**, Arlington, VA June 2012 – Feb 2013
Web Developer / Security Researcher
- Created and operated the Hume Center web portal
 - Set-up and debugged various systems (LDAP, MySQL, Apache)
 - Aided in research to close security holes in the Android operating system.
- Supervisor: Dr. Charles Clancy

Projects

Pacifist: A non-intrusive, well-informed, intelligent baby monitor and pacifier, Smart Device

Baby monitor that uses machine learning of sensor data gathered from a pacifier to predict macro states of infants such as hunger and fatigue. Project is a finalist for the international MIT linQ Idea2 competition. <http://goo.gl/FUy61H>

Online Adaptive Frequency Hopping, Patent Pending Wireless Protocol / Algorithm

Algorithm to improve network stability and throughput through opportunistic access and environmental modeling. Capable of working with existing hardware while providing 47% increase of data rate and able to withstand high volatility scenarios such as after earthquakes or natural disasters when congestion stops existing protocol. Provisional patent accepted June 2014.

EmotivAid, Smart Device

Created smart watch geared for autistic users to help them identify emotion. Device listens to surrounding conversation and classifies current speaker's emotion by onscreen picture. <https://goo.gl/89LF77>

Optricks Programming Language, Programming Language / Compiler

Programming language capable of running 30% faster than C while adding high-level features such as garbage collection, function generators, classes, functional programming, lazy evaluation, among others. Compiler written in C++ with LLVM as a target for portability to a variety of clients such as the Google Chrome browser.

Selected Publications

Tapir: Embedding Fork-Join Parallelism in LLVM's Intermediate Representation, in progress

Tao B. Schardl, William S. Moses, Charles E. Leiserson

<http://wsmoses.com/tapir.pdf>

Extreme Multi-Resolution Visualization: A Challenge On Many Levels

SuperComputing 2015 Visualization Showcase

<http://goo.gl/mmffEA>

Joanna Balme, Eric Brown-Dymkoski, Victor Guerrero, Stephen Jones, Andre Kessler, Adam Lichtl, Kevin Lung, William Moses, Ken Museth, Tom Fogel

Computational Complexity of Arranging Music

Mathematics of Various Entertaining Subjects 2015

<https://arxiv.org/pdf/1607.04220.pdf>

William S. Moses, Erik D. Demaine

Awards & Activities

MIT Undergraduate Association, Voting Representative

Feb 2016 – present

One of twenty voting members of MIT's institute-wide student government. Working on issues such as the creation of a new dormitory, institute-wide sustainability programs, student withdrawal policy, among others.

MIT Competitive Programming Team

November 2014

Competed in algorithmic contests including Intercollegiate Programming Competition, winning 2nd at BOSPRE / 4th at regionals

Intel Science and Talent Search, Semifinalist

Jan 2014

Research award for top 300 science projects in the country for Online Adaptive Frequency Hopping

USA Computing Olympiad, Gold Division

Dec 2012 – June 2014

Premier high school programming competition; Gold is the highest division

Technical Skills

Programming Languages

C/C++, Python, Java, Javascript/JQuery, HTML, CSS, SQL, PHP, Mathematica, Matlab, \LaTeX

Libraries

Tensorflow, Caffe, CUDA, LLVM, Cilk, OpenMP, NumPy, GNURadio, MPI, OpenGL, Django, OpenCV, OpenSmile

Topics/Systems

Neural Networks/Deep Learning, Quantum Information, Parallelism, Data Analysis, Compilers, Android