Matthew O'Shaughnessy

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EDUCATION

B.S. Electrical Engineering, Georgia Institute of Technology **Expected May 2016**

- Concentrations: signal processing, computer architecture
- Minor in Computer Science – concentration in AI/machine learning
- Research option (culminates in undergraduate thesis)
- Overall GPA: 3.72/4.0, ECE GPA 3.68, CS GPA 4.0

EXPERIENCE

Electrical Engineering Co-op, Georgia Tech Research Institute **May 2014 – Present**

Electro-Optical Systems Lab – Remote Sensing Group

- Optimized and multithreaded bathymetric lidar processing system in C++, CUDA, and VHDL, enabling real-time calculation and visualization of results; designed processing algorithms in MATLAB
- Work resulted in GTRI being first in bathymetric lidar industry to achieve realtime processing with 40kHz laser fire rate
- Wrote C++ arbitrary waveform generator sequencing program, allowing simulation of bathymetric lidar system
- Designed Helmholtz coil for medical device testing, saving thousands of dollars vs off the shelf product; simulated using CST

Teaching Assistant, CS 1371 (Computing for Engineers) **August 2013 - Present**

- Taught weekly recitation to 50 students, earning over 4.5/5 each semester on end of term student evaluation
- Developed and graded exams, held office hours 3 hrs/week, created teaching resources for students and other TAs
- Developed new interactive practice question bank with team of six TAs in Python/HTML/CSS/JS, accessed by 1000+ unique students per semester

Undergraduate Research, Georgia Tech **August 2012 – Present**

Center for Signal and Information Processing *August 2014 – Present*

- Researched novel algorithms for collaborative filtering and sparse matrix recovery (begun August 2014)

Efficient Signal Processing Lab *August 2013 – May 2014*

- Implemented deep belief networks in MATLAB and Python for classification and fusion of multimodal sensor data
- Implemented performance-intensive portions of deep belief network training algorithm in CUDA C++ for CPU execution
- Team won third place out of twenty-one teams in annual ORS program research competition

Parallel and Distributed Computing Lab *August 2012 – May 2013*

- Wrote distributed storage component of a MapReduce/Apache Hadoop simulator in Java, used to evaluate performance of different distributed storage topologies for MapReduce jobs
- Team won second place out of eighteen teams in annual ORS program research competition

Leadership Positions

- ECE Section Editor, The Tower (Georgia Tech Undergraduate Research Journal)
- Principal Violist, Georgia Tech Symphony Orchestra

SKILLS

Programming	MATLAB, C/C++, CUDA, Python, Java, Assembly, VHDL, Web (HTML, CSS, JavaScript) Data structures, Sorting and search algorithms
Hardware	FPGAs, Microcontrollers, Circuit analysis and design, Electronics instrumentation
Software	EAGLE, SPICE, Version control (Git, SVN), Windows/Linux
Signal Processing	Theory: correlations, DTFT/DFT/FFT, z-transforms, sampling theory, filter design, quantization Implementation: RADAR, array, image, and speech processing algorithms
Coursework	Signal processing: Advanced DSP, Signals and systems, Applications of DSP, Pattern recognition (graduate level) Other: Introductory and advanced computer architecture, Electromagnetic theory, Circuit analysis/design

OTHER

Projects	http://matthewoshaughnessy.github.io/
Awards	National Merit Corporate Scholarship, Zell Miller Scholarship (full tuition), Kelley Family Music Scholarship, Dean's List, Faculty Honors
Clearance	Department of Defense Security Clearance