Thomas Alexander

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Personal Statement

As a soon to be graduate of Mount Allison University's physics, mathematics and computer science programs I am driven to understand how the world works. My undergraduate education has given me the basic tools to commence with even more intensive studies. It is my goal to obtain an even greater background in theoretical physics, specifically quantum mechanics and its related theories before switching over to an experimental PhD. I wish to work on the development of the first scalable universal quantum computer throughout my education and afterwards as a career. While performing summer research at the Institute for Quantum Computing in Waterloo, Canada I was given the taste for academia and research. I was given lots of freedom in my research and development of a control system for one of NIST's neutron interferometry labs and also got to learn the theory of neutron interferometry simultaneously. Additionally, as an attendee of IQC's undergraduate school on experimental quantum information processing, I was given an even greater introduction to a variety of aspects of quantum information including its theory,NMR,nitrogen vacancy centres, quantum optics, quantum dots and quantum hacking all of which furthered my passion to understand the theory to a greater degree.

Education

Undergraduate School on Experimental Quantum Information Processing *May 2013 - June 2013*
Institute for Quantum Computing, Waterloo, ON

Honours Physics and a double minors in Computer Science and Mathematics — GPA 3.65
September 2010 - Current
Mount Allison University, Sackville, NB

Career History

Undergraduate Research, *Institute For Quantum Computing* *Current*

- Working with Chris Granade to design an experiment to improve the contrast of neutron interferometry phase measurements, using Bayesian MCMC methods.
- Designed and developed a neutron interferometry control system to be installed at National Institute for Standards and Technology in Gaithersburg, MD.
- Implementation of likelihood functions on GPGPUs.

Software Development Intern, *G2 Research* *Summer 2012*

- Development of cellular tracking and analysis software.
- Setup OpenStreetMaps rendering server.
- Product and software research.

IT Manager, *The Argosy Newspaper* *2011-2012*

- Setup and maintenance of Drupal news site
- Cloud server setup on NGINX/PHP-FPM stack.
- Serviced companies equipment and network.

MSDS Database Creation, *Maritime Beauty* *Summer 2011*

- Setup a Material Safety Data Sheet database for Maritime Beauty on proprietary software.
- Networked with outside companies to develop relationships and acquire information.

Production Manager, *Skratch That* *2009-2010*

- Production manager of an entrepreneurial startup that was part of the Junior Achievement program. Responsible for production of the companys product and production implementation. Skratch That won Company of the Year in all of Atlantic Canada for 2010.

Skills

Physics: Neutron Interferometry, Quantum Mechanics, Quantum Computing, Electrodynamics, Optics, Solid State Physics, Classical Mechanics, Analog Electronics, Digital Electronics

Hardware: FPGA, Arduino, GPGPU programming, Cloud computing, Analog Electronics

Programming: Java, Scala/Akka, HTML5/CSS, JavaScript/Node.js, Mathematica, LaTeX, Python/scipy, SQL, C, Cuda C, OpenCl, git, svn, MongoDB

Programming Concepts: Algorithms Analysis, Object Orientated Programming , Unit Testing, Quantum Computing, Computer Architecture, Functional Programming, Data Structures, Databases, Networking, Neural Networking, Basic AI

Operating Systems: Linux, Windows, Mac OSX

Leadership Activities

Tutor, Physics and Computer Science *2010 - Current*

Awards and Honors

4'th Place, The 2012 Northeast North America Regional ACM Contest Preliminary *2012*

3'rd Place, Robot's East Atlantic Championships *2010*

1'st Place, Robot's East Atlantic Championships *2009*

1'st Place, Robot's East Atlantic Championships *2008*