

# THOMAS ALEXANDER

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## PERSONAL STATEMENT

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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 long-term goal to work on the development of the first scalable universal quantum computer.

While performing summer research at the Institute for Quantum Computing in Waterloo, Canada I was given the opportunity to work on my own project for the summer. I had a significant amount of freedom in the research and development of a control system for one of the National Institute for Science and Technology's neutron interferometry labs. This was a uniquely challenging project that involved all of the components of software design including design principles, testing, documentation, performance analysis and writing loads of code. This opportunity further reinforced that I wish to work at a small intimate company in the future in which I can have a real outcome on the direction and development of the product.

## EDUCATION

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

**Honours Physics and a double minor in Computer Science and Mathematics — GPA 3.65**

*September 2010 - Current*

*Mount Allison University, Sackville, NB*

## CAREER HISTORY

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

- Working with researchers 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

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

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

**Programming:** Java, Scala/Akka, HTML5/CSS, JavaScript/Node.js, Mathematica, L<sup>A</sup>T<sub>E</sub>X, 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

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<b>Tutor</b> , Physics and Computer Science	<i>2010 - Current</i>
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#### AWARDS AND HONORS

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<b>4<sup>th</sup> Place</b> , The 2012 Northeast North America Regional ACM Contest Preliminary	<i>2012</i>
<b>3<sup>rd</sup> Place</b> , Robot's East Atlantic Championships	<i>2010</i>
<b>1<sup>st</sup> Place</b> , Robot's East Atlantic Championships	<i>2009</i>
<b>1<sup>st</sup> Place</b> , Robot's East Atlantic Championships	<i>2008</i>