Matthew **Walker**

Software Developer

Toronto, ON, Canada

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Summary

Graduate of the University of Toronto, 9+ years experience developing software in an academic setting. 1.5 years experience developing full-stack software in a professional setting. Loves Emacs, Linux, and Haskell. Programming language polyglot. Interested in developing software using cutting edge mathematical techniques for reliability and agility. Always up for a new challenge or solving a problem.

Skills

Languages	English
DevOps	Kubernetes, Helm 2/3, GitLab (including GitLab CI), AWS, Keter (Haskell)
Back-end	SAFE Stack (F#), Yesod (Haskell), ElasticSearch, Postgres, NodeJS, REST APIs
Front-end	Fable (F#), HTML5, React, Bootstrap, jQuery, LESS, SASS
Programming	F#, Haskell, JavaScript/TypeScript, Python, Rust, C/C++, Mathematica, Bash, MATLAB, LaTeX
Mathematics	Differential Geometry, Group Theory, Category Theory, Type Theory, Computational Complexity Theory, Computational Stability Theory
Physics	Quantum Information & Quantum Computing, Quantum Field Theory, General Relativity

Education

University of Toronto — *Toronto, Canada*

H.B.Sc. Specialist in Mathematics and Physics — *Sep. 2009-Apr. 2012; Jan. 2015-Aug. 2018*

Stanford University via Coursera — *Online [link]*

Machine Learning Coursera Certificate — *December 2019*

deeplearning.ai via Coursera — *Online [link]*

Deep Learning Specialization — *December 2019*

- Neural Networks and Deep Learning
- Convolutional Neural Networks
- Sequence Models
- Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization
- Structuring Machine Learning Projects

Extracurricular Activity

University of Toronto – Physics Student Union (PhySU) — *Toronto, Canada*

Vice President – Academic Affairs — *Sep. 2017 - Apr. 2018*

- Organized and led undergraduate research seminars to enable peers to share their work and to ask questions.
- Organized and presented tutorials on programming and LaTeX document preparation.
- Generally advised peers on academic matters.

University of Toronto – Independent Learning in Science (Sanctioned Student Group) — *Toronto, Canada*

Co-founder and Co-president — *Maybe. 2017 - Aug. 2018*

- Lead discussions with peers on material not taught to undergraduates normally, including quantum information and quantum measurement theory.

Work Experience

Prolucid Technologies Inc. — *Mississauga, Canada*

Junior Software Developer - Intermediate Software Developer — *March 2019 - Present*

- Implementation of sophisticated, real-time Industrial Internet-of-Things applications involving massive data collection and analysis.
- Creation and administration of large, scalable Kubernetes infrastructure.
- Communication with stakeholders and technical leadership on projects involving small teams.
- Contribution to open source projects.

University of Toronto – Atmospheric Physics – under Prof. K. Walker (no relation)

Toronto, Canada

NSERC CREATE Trainee Intern — *May. 2010 - Aug. 2010*

- Automated execution of spectral analysis for data collected by the PARIS-IR spectrometer.
- Traveled to Dalhousie University and set up the PARIS-IR spectrometer on site.

University of Toronto – under Prof. A. Steinberg

Toronto, Canada

PHY371Y1Y – Supervised Study in Physics (Course) – *Quantum Information and Measurement* — *Sep. 2015 - Apr. 2016*

- Studied quantum computing theory.
- Studied quantum information theory.
- Read research papers on the subjects of quantum discord, deterministic quantum computing with one qubit (DQC1), sharing entanglement without communicating non-separable states.
- Produced report and presentation to Prof. Steinberg and the Physics Dept. Undergraduate Chair on the topic of quantum discord.

University of Toronto – Chemical Physics Theory Group – under Prof. P. Brumer

Toronto, Canada

CQIQC Summer Studentship Award Recipient — *May 2016 - Aug. 2016*

- Learned the quantum Liouville formalism to investigate the Hilbert space structure of classical mechanics.
- Provided proofs for classical analogues of the no-cloning theorem and teleportation schemes in continuous variable systems.

University of Toronto – Chemical Physics Theory Group – under Prof. P. Brumer

Toronto, Canada

CHM499Y1Y – Introduction to Chemistry Research (Course) — *Sep. 2016 - Apr. 2017*

- Developed a novel theoretical test for entanglement of a wavefunction in continuous variable systems.

University of Toronto – Chemical Physics Theory Group – under Prof. P. Brumer

Toronto, Canada

Paid Research Position — *May 2017 - Aug. 2017*

- Extended above wavefunction test to study the dynamics of entanglement in continuous and discrete variable systems.
- Derived evolutionary equation for entanglement in general pure systems.

Open Source Contributions

Fantomas (The F# Formatter) Project

Contributor — *September - October 2020*

- Added support for line breaking constructs based on the number of items in those constructs, rather than their character length.
- See PRs: Fantomas 1147, Fantomas 1169, Fantomas 1177

shell-conduit – Haskell conduit support library

Contributor — *September 2019 - June 2020*

- Changed concrete IO monad to a MonadUnliftIO m constraint. Allows use of resourcet with file redirection, for example.
- See PR: shell-conduit 17

Helm Charts Project

Contributor — *Feb 8, 2020*

- Allow filesystem of Cassandra database configs to be read/write.
- See PR: Helm Charts 20511

Linux Kernel Open Source Project

Contributor — *December 5, 2013*

- Added support for newer multitouch touchpads.
- See commit: 9cb80b965eaf7af1369f6e16f48a05fbaaccc021

gfx-rs Rust Bindless Graphics API Project

Contributor — *Aug 2, 2018*

- Added support for dynamic uniform and storage buffers.
- See commit: 602f82effe807a8d42608feb045881e43db73cb2