Vincent Russo

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United States: Citizen
Canada: Permanent Resident

LinkedIn: https://ca.linkedin.com/in/vrusso11
Github: https://github.com/vprusso
Webpage: http://vprusso.github.io

Education

- **University of Waterloo** — Sep 2012 – Feb 2017
  Ph.D., Computer Science
- **Wayne State University** — Sep 2010 – Aug 2011
  M.Sc., Computer Science
- **Wayne State University** — Sep 2007 – Aug 2010
  B.Sc., Computer Science

Experience

- **Director and Co-founder – Modellicty**, Toronto, ON — Jan 2018 – Present

  – Built probability-of-default models and software solutions for clients in the credit risk space.

  – Lead software engineer in developing *Modellicity Wizard*; a software product that streamlines the process of model development for the financial sector.

- **Software Engineer – UnitaryFund**, New York, NY — Jan 2020 – Present

  – Co-developer of *metriq*; an online platform built using React, Javascript, and Postgres where users can upload and compare against state-of-the-art quantum computing benchmarking results.

- **Software Engineer – ISARA**, Waterloo, ON — May 2017 – Nov 2021

  – Developed company's first correctness testing suite for NIST-approved post-quantum cryptographic protocols. This process involved either finding, or developing from scratch (in Python), third-party implementations of these algorithms to compare against our internal implementations.

  – Developed an internal testing suite for ISARA's *OpenSSL Connector*; an enhanced version of OpenSSL that is patched with various post-quantum cryptographic primitives.

- **Graduate Researcher – University of Waterloo**, Waterloo, ON — Sep 2012 – Feb 2017

  – Contributor to *QETLAB*; a software package used to study theoretical aspects of quantum computing. Software has been cited in numerous scientific publications.

- **Software Engineer, Consultant – SkyWatch**, Kitchener, ON — Sep 2016 – Oct 2016

  – Developed back-end data acquisition and processing service using Python, MySQL, and AWS resulting in an API service.

- **Software Engineer, Intern – Raytheon BBN Technologies**, Cambridge, MA — May 2012 – Sep 2012

  – Contributed to the development of *QuaFL*; a statically typed domain-specific language to study quantum computing using Python.

- **Research Assistant – Wayne State University**, Detroit, MI — Nov 2010 – Jan 2012

  – Contributed to development of *GOMC*; a GPU-driven open-source Monte Carlo simulation engine written in C++ that uses the CUDA library. Our software yields a 29 times faster implementation than an optimized serial CPU-driven code.

- **Software Engineer – Wayne State University**, Detroit, MI — Nov 2010 – Nov 2011

  – Developed a web client in PHP and Python to interface with mobile devices that tracked and stored data from several hundred patients in a MySQL database. Software has been cited in peer-reviewed work.

- **Software Engineer, Intern – University of Michigan**, Ann Arbor, MI — May 2010 – Sep 2010

  – Processed several hundred gigabytes of data sent back from spacecraft. Used IDL, C++, and Python to perform analysis and data visualization for internal reports.

  – Solved an issue unresolved by NASA engineers by analyzing anomalous data sent back from spacecraft. Presented an oral and written report of work to department.

Technical Skills

- **Languages:** Python, C/C++, Java, Javascript, HTML, CSS, Rust, Go, SQL, PHP, R, MATLAB
- **Tools:** Django, Postgres, MongoDB, React, Selenium, Qt, NumPy, SciPy, Pandas, Regex, LaTeX, bash, git

CONSULTING

◇ **Wellfound Foods**, Washington, DC — Jul 2021 – Present

– Development of analytics dashboard and proprietary software for the company's internal data warehouse.

◇ **Byte-by-Byte**, New York, NY — Sep 2019 – Nov 2019

– Technical writing and software development for a company's internal education content.

◇ **ODX**, Saint-Laurent, QC — Jul 2019 – Aug 2020

– Custom-built software deliverable and development of EAD (exposure-at-default) model.

◇ **OnDeck**, New York, NY — Jul 2019 – Aug 2020

– Custom-built software deliverable and development of PD (probability-of-default) model.

◇ **AutoCapital Canada**, Toronto, ON — Sep 2019 – Nov 2019

– Software deliverable for extraction and cleaning of data. Development of PD (probability-of-default) model.

PUBLICATIONS

◇ *"Arkhipov's theorem, graph minors, and linear system nonlocal games"*,
C. Paddock, V. Russo, T. Silverthorne, W. Slofstra,
(In Progress), (2021).

◇ *"A note on the antidistinguishability conjecture"*,
V. Russo, J. Sikora, B. Singer,
(In Progress), (2021).

◇ *"Optimal discrimination of noisy Bell states by local operations and classical communication requires maximal entanglement"*,
S. Bandypadhhyay, V. Russo,
Physical Review A, Vol. 104, No. 3, (2021).

◇ *"toqito – Theory of quantum information toolkit: A Python package for studying quantum information"*,
V. Russo,
Journal of Open Source Software, 6(61), 3082, (2021).

◇ *"Extended nonlocal games and quantum-classical games"*,
V. Russo, J. Watrous,
Chicago Journal of Theoretical Computer Science, Volume: 2018, Article: 4, (2018).

◇ *"Quantum hedging in two-round prover-verifier interactions"*,
S. Arunachalam, A. Molina, V. Russo,
Theory of Quantum Computation, Communication and Cryptography (TQC), (2017).

◇ *"Extended nonlocal games and monogamy-of-entanglement games,"*,
N. Johnston, R. Mittal, V. Russo, J. Watrous,
Proceedings of the Royal Society A, Volume: 472 Issue 2189, (2016).

◇ *"Limitations on separable measurements from cone programming"*,
S. Bandypadhyay, A. Cosentino, N. Johnston, V. Russo, J. Watrous,
IEEE Transactions on Information Theory, (Volume:61, Issue 6), (2015).

◇ *"Is absolute separability determined by the partial transpose?"*,
S. Arunachalam, N. Johnston, V. Russo,
Quantum Information & Computation, 15(7& 8):0694-0720, (2015).

◇ *"An algorithm for the T-count"*,
D. Gosset, V. Kliuchnikov, M. Mosca, V. Russo,
Quantum Information & Computation, Volume 14 Issue 15-16, Pages 1261-1276, (2014).

◇ *"Small sets of locally indistinguishable orthogonal maximally entangled states"*,
A. Cosentino, V. Russo,
Quantum Information & Computation, Volume 14 Issue 13-14, Pages 1098-1106, (2014).

◇ *"GPU-accelerated Gibbs ensemble Monte Carlo simulations of Lennard-Jonesium"*,
J. Mick, E. Hailat, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff,
Computer Physics Communications, (2013).

◇ *"Parallel Monte Carlo simulation for the canonical ensemble on the GPU"*,
E. Hailat, J. Mick, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff,
Journal of Parallel and Distributed Computing, (2012).

◇ *"Beatty sequences, Fibonacci sequences, and the Golden ration"*,
V. Russo, L. Schwiebert,
Fibonacci Quarterly 49, 151-154 (2011).

THESES

◇ *"Extended nonlocal games " (Ph.D.)*,
V. Russo,
University of Waterloo, (2017).

PROCEEDINGS

◇ *"GPU MCMC developments: CBMC nonpolar molecules, verlet lists, and architectural optimizations"*,
J. Mick, E. Hailat, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff,
AIChE (American Institute of Chemical Engineers), (2012).

◇ *"Optimization of a Lennard-Jones particle Monte Carlo GPU-code"*,
J. Mick, E. Hailat, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff, AIChE (American Institute of Chemical Engineers), (2012).

◇ *"GPU accelerated configurational bias Monte Carlo simulations of linear alkanes"*,
J. Mick, E. Hailat, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff,
AIChE (American Institute of Chemical Engineers), (2012).

◇ *"GPU accelerated Monte Carlo simulations in the Gibbs and canonical ensembles"*,
J. Mick, E. Hailat, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff,
AIChE (American Institute of Chemical Engineers), (2011).

PRESENTATIONS

◇ "Numerical tools for studying extended nonlocal games", *University of Ottawa*, (2021).

◇ "Solving semidefinite programs in Python", *Louisana State University*, (2021).

◇ "$|toqito\rangle$: Theory of quantum information toolkit", *New York City Quantum Computing Meetup*, (2020).

◇ "Extended nonlocal from quantum-classical games", *University of Waterloo, Institute for Quantum Computing seminar*, (2016).

◇ "Extended nonlocal games and monogamy-of-entanglement games", *Quantum Information Processing (QIP)*, (2015).

◇ "Limitations of separable measurements from cone programming", *Quantum Information Processing (QIP)*, (2014).

◇ "Quantum hedging in two-round prover-verifier interactions", *Quantum Information Processing (QIP)*, (2013).

◇ "Small sets of locally indistinguishable orthogonal maximally entangled states", *Quantum Information Processing (QIP)*, (2013).

◇ "An algorithm for the T-count", *Quantum Information Processing (QIP)*, (2013).

◇ "GPU MCMC developments: CBMC nonpolar molecules, verlet lists, and architectural optimizations", *American Institute of Chemical Engineering (AIChE)*, (2012).

◇ "GPU-based Monte Carlo simulations for canonical and Gibbs ensembles", *NVIDIA, GTC*, (2012).

INDEPENDENT PROJECTS

◇ Created LucidProgramming; a YouTube channel with 40K+ subscribers that teaches individuals how to approach data structures and algorithms in Python among other skills. Partnered with Educative to create a course around my tutorial content.

◇ Created $|toqito\rangle$; an open source Python library for studying various objects in quantum information, namely, states, channels, and measurements.

◇ Cohost "Nonlocal"; a quantum computing podcast with William Slofstra and Henry Yuen.