

Vincent Russo

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United States: Citizen

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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 – Modellicity , 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 <i>Modellicity Forge</i> ; 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 <i>metriq</i> ; an online platform built using React, Javascript, and Postgres where users can upload and compare against state-of-the-art quantum computing benchmarking results.	
	– Contributed to <i>mitiq</i> ; an opensource Python tool to implement error mitigation techniques on quantum computers. Produced research pertaining to increasing the quantum volume via error mitigation using <i>mitiq</i> .	
	◇ 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 <i>OpenSSL Connector</i> ; 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 <i>QETLAB</i> ; 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 <i>QuaFL</i> ; 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 <i>GOMC</i> ; 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, L ^A T _E X, 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 – Present
– 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.
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- PUBLICATIONS
- ◇ “*Arkhipov’s theorem, graph minors, and linear system nonlocal games*”,
C. Paddock, V. Russo, T. Silverthorne, W. Slofstra,
arXiv:2205.04645, (2022).
 - ◇ “*A note on inner products of quantum states and their (anti)distinguishability*”,
V. Russo, J. Sikora,
(In progress), (2022).
 - ◇ “*Error mitigation increases the effective quantum volume of quantum computers*”,
R. LaRose A. Mari, V. Russo, D. Strano, W. Zeng,
arXiv:2203.05489, (2022).
 - ◇ “*Entanglement cost of discriminating noisy Bell states by local operations and classical communication*”,
S. Bandyadhyay, 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. Bandyadhyay, 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 ratio*”,
V. Russo, L. Schwiebert,
Fibonacci Quarterly 49, 151-154 (2011).

- THESES
- ◇ “*Extended nonlocal games*” (Ph.D.), V. Russo, University of Waterloo, (2017).
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- 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).
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- PRESENTATIONS
- ◇ “Numerical tools for studying extended nonlocal games”, *University of Ottawa*, (2021).
 - ◇ “Solving semidefinite programs in Python”, *Louisiana State University*, (2021).
 - ◇ “|toqito>: 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).
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- 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); 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.