

Vincent Russo

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Webpage: <http://vprusso.github.io>

EDUCATION	<ul style="list-style-type: none">◇ 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
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EXPERIENCE	<ul style="list-style-type: none">◇ Director and Co-founder – Modellicity, Toronto, ON Jan 2018 – Present<ul style="list-style-type: none">– 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<ul style="list-style-type: none">– 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<ul style="list-style-type: none">– 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<ul style="list-style-type: none">– 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<ul style="list-style-type: none">– 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<ul style="list-style-type: none">– 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<ul style="list-style-type: none">– 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<ul style="list-style-type: none">– 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<ul style="list-style-type: none">– 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.
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TECHNICAL SKILLS	<ul style="list-style-type: none">◇ 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^AT_EX, bash, git
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- 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,
(In progress), (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:X, (2022).
 - ◇ “*Optimal discrimination of noisy Bell states by local operations and classical communication requires maximal entanglement*”,
S. Bandypadhyay, 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 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.