

# Vincent Russo

vincentrusso1@gmail.com | 519.998.6049  
United States: Citizen  
Canada: Permanent Resident

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

---

EDUCATION	<ul style="list-style-type: none"><li>◇ <b>University of Waterloo</b> Sep 2012 – Feb 2017 Ph.D., Computer Science</li><li>◇ <b>Wayne State University</b> Sep 2010 – Aug 2011 M.Sc., Computer Science</li><li>◇ <b>Wayne State University</b> Sep 2007 – Aug 2010 B.Sc., Computer Science</li></ul>
-----------	---

---

EXPERIENCE	<ul style="list-style-type: none"><li>◇ <b>Director and Co-founder – Modellicity</b>, Toronto, ON Jan 2018 – Present<ul style="list-style-type: none"><li>– Built probability-of-default models and software solutions for clients in the credit risk space.</li><li>– Lead software engineer in developing <i>Modellicity Forge</i>; a software product that streamlines the process of model development for the financial sector.</li></ul></li><li>◇ <b>Software Engineer – UnitaryFund</b>, New York, NY Jan 2020 – Present<ul style="list-style-type: none"><li>– 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.</li><li>– 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>.</li></ul></li><li>◇ <b>Software Engineer – ISARA</b>, Waterloo, ON May 2017 – Nov 2021<ul style="list-style-type: none"><li>– 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.</li><li>– 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.</li></ul></li><li>◇ <b>Graduate Researcher – University of Waterloo</b>, Waterloo, ON Sep 2012 – Feb 2017<ul style="list-style-type: none"><li>– Contributor to <i>QETLAB</i>; a software package used to study theoretical aspects of quantum computing. Software has been cited in numerous scientific publications.</li></ul></li><li>◇ <b>Software Engineer, Consultant – SkyWatch</b>, Kitchener, ON Sep 2016 – Oct 2016<ul style="list-style-type: none"><li>– Developed back-end data acquisition and processing service using Python, MySQL, and AWS resulting in an API service.</li></ul></li><li>◇ <b>Software Engineer, Intern – Raytheon BBN Technologies</b>, Cambridge, MA May 2012 – Sep 2012<ul style="list-style-type: none"><li>– Contributed to the development of <i>QuaFL</i>; a statically typed domain-specific language to study quantum computing using Python.</li></ul></li><li>◇ <b>Research Assistant – Wayne State University</b>, Detroit, MI Nov 2010 – Jan 2012<ul style="list-style-type: none"><li>– 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.</li></ul></li><li>◇ <b>Software Engineer – Wayne State University</b>, Detroit, MI Nov 2010 – Nov 2011<ul style="list-style-type: none"><li>– 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.</li></ul></li><li>◇ <b>Software Engineer, Intern – University of Michigan</b>, Ann Arbor, MI May 2010 – Sep 2010<ul style="list-style-type: none"><li>– Processed several hundred gigabytes of data sent back from spacecraft. Used IDL, C++, and Python to perform analysis and data visualization for internal reports.</li><li>– 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.</li></ul></li></ul>
------------	--

---

TECHNICAL SKILLS	<ul style="list-style-type: none"><li>◇ <b>Languages:</b> Python, C/C++, Java, Javascript, HTML, CSS, Rust, Go, SQL, PHP, R, MATLAB</li><li>◇ <b>Tools:</b> Django, Postgres, MongoDB, React, Selenium, Qt, NumPy, SciPy, Pandas, Regex, L<sup>A</sup>T<sub>E</sub>X, bash, git</li></ul>
------------------	---

CONSULTING	♦ <b>Wellfound Foods</b> , Washington, DC	Jul 2021 – Present
	– Development of analytics dashboard and proprietary software for the company’s internal data warehouse.	
	♦ <b>Byte-by-Byte</b> , New York, NY	Sep 2019 – Present
	– Technical writing and software development for a company’s internal education content.	
	♦ <b>ODX</b> , Saint-Laurent, QC	Jul 2019 – Aug 2020
	– Custom-built software deliverable and development of EAD (exposure-at-default) model.	
	♦ <b>OnDeck</b> , New York, NY	Jul 2019 – Aug 2020
	– Custom-built software deliverable and development of PD (probability-of-default) model.	
	♦ <b>AutoCapital Canada</b> , 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), (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).
- ♦ “*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).
- 
- 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”, *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).
- 
- 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.