

# Vincent Russo

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

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EDUCATION	◇ <b>University of Waterloo</b>	Sep 2012 – Feb 2017
	Ph.D., Computer Science	
	◇ <b>Wayne State University</b>	Sep 2010 – Aug 2011
	M.Sc., Computer Science	
	◇ <b>Wayne State University</b>	Sep 2007 – Aug 2010
	B.Sc., Computer Science	

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EXPERIENCE	◇ <b>Director and Co-founder – Modellicty</b> , 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 Wizard</i> ; a software product that streamlines the process of model development for the financial sector.	
	◇ <b>Software Engineer – UnitaryFund</b> , 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.	
	◇ <b>Software Engineer – ISARA</b> , 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.	
	◇ <b>Graduate Researcher – University of Waterloo</b> , 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.	
	◇ <b>Software Engineer, Consultant – SkyWatch</b> , Kitchener, ON	Sep 2016 – Oct 2016
	– Developed back-end data acquisition and processing service using Python, MySQL, and AWS resulting in an API service.	
	◇ <b>Software Engineer, Intern – Raytheon BBN Technologies</b> , 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.	
	◇ <b>Research Assistant – Wayne State University</b> , 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.	
	◇ <b>Software Engineer – Wayne State University</b> , 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.	
	◇ <b>Software Engineer, Intern – University of Michigan</b> , 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.	

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TECHNICAL SKILLS	◇ <b>Languages:</b> Python, C/C++, Java, Javascript, HTML, CSS, Rust, Go, SQL, PHP, R, MATLAB
	◇ <b>Tools:</b> Django, Postgres, MongoDB, React, Selenium, Qt, NumPy, SciPy, Pandas, Regex, L <sup>A</sup> T <sub>E</sub> X, bash, git

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 – Nov 2019
	– 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.	

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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), (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. Bandyopadhyay, 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. Bandyopadhyay, 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	<ul style="list-style-type: none"> <li>◇ “<i>Extended nonlocal games</i> ” (Ph.D.), V. Russo, University of Waterloo, (2017).</li> </ul>
PROCEEDINGS	<ul style="list-style-type: none"> <li>◇ “<i>GPU MCMC developments: CBMC nonpolar molecules, verlet lists, and architectural optimizations</i>”, J. Mick, E. Hailat, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff, AIChE (American Institute of Chemical Engineers), (2012).</li> <li>◇ “<i>Optimization of a Lennard-Jones particle Monte Carlo GPU-code</i>”, J. Mick, E. Hailat, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff, AIChE (American Institute of Chemical Engineers), (2012).</li> <li>◇ “<i>GPU accelerated configurational bias Monte Carlo simulations of linear alkanes</i>”, J. Mick, E. Hailat, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff, AIChE (American Institute of Chemical Engineers), (2012).</li> <li>◇ “<i>GPU accelerated Monte Carlo simulations in the Gibbs and canonical ensembles</i>”, J. Mick, E. Hailat, V. Russo, K. Rushaidat, L. Schwiebert, J. Potoff, AIChE (American Institute of Chemical Engineers), (2011).</li> </ul>
PRESENTATIONS	<ul style="list-style-type: none"> <li>◇ “Numerical tools for studying extended nonlocal games”, <i>University of Ottawa</i>, (2021).</li> <li>◇ “Solving semidefinite programs in Python”, <i>Louisiana State University</i>, (2021).</li> <li>◇ “<i> toqito&gt;</i>: Theory of quantum information toolkit”, <i>New York City Quantum Computing Meetup</i>, (2020).</li> <li>◇ “Extended nonlocal from quantum-classical games”, <i>University of Waterloo, Institute for Quantum Computing seminar</i>, (2016).</li> <li>◇ “Extended nonlocal games and monogamy-of-entanglement games”, <i>Quantum Information Processing (QIP)</i>, (2015).</li> <li>◇ “Limitations of separable measurements from cone programming”, <i>Quantum Information Processing (QIP)</i>, (2014).</li> <li>◇ “Quantum hedging in two-round prover-verifier interactions”, <i>Quantum Information Processing (QIP)</i>, (2013).</li> <li>◇ “Small sets of locally indistinguishable orthogonal maximally entangled states”, <i>Quantum Information Processing (QIP)</i>, (2013).</li> <li>◇ “An algorithm for the T-count”, <i>Quantum Information Processing (QIP)</i>, (2013).</li> <li>◇ “GPU MCMC developments: CBMC nonpolar molecules, verlet lists, and architectural optimizations”, <i>American Institute of Chemical Engineering (AIChE)</i>, (2012).</li> <li>◇ “GPU-based Monte Carlo simulations for canonical and Gibbs ensembles”, <i>NVIDIA, GTC</i>, (2012).</li> </ul>
INDEPENDENT PROJECTS	<ul style="list-style-type: none"> <li>◇ 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.</li> <li>◇ Created <i> toqito&gt;</i>; an open source Python library for studying various objects in quantum information, namely, states, channels, and measurements.</li> </ul>