

Vincent Russo

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Research Interests

Computer Science, Quantum Computation & Quantum Information, Software Engineering, Theoretical Computer Science, Semidefinite Programming.

Education

- Ph.D. Computer Science (Quantum Information), University of Waterloo 2012 (in progress).
Advisors: Michelle Mosca and John Watrous
- M.Sc. Computer Science, Wayne State University 2011.
- B.Sc. Computer Science, Wayne State University 2010.

Professional and Research Experience

- *Raytheon BBN Technologies (Internship): 06/12 - 09/12,*
Performed research on quantum compilers and quantum programming languages. BBN Technologies, Cambridge, MA, USA.
- *Institute for Quantum Computing (Visiting Researcher): 07/11 - 08/11,*
Performed research at the Institute for Quantum Computing with John Watrous on quantum complexity theory. University of Waterloo, Ontario, Canada.
- *University of Michigan Aerospace Engineering (Research Assistant): 05/10 - 09/10,*
Performed analysis and developed software tools for data sent back from the MESSENGER spacecraft. Space Physics Research Lab, University of Michigan, Ann Arbor, USA.
- *Graduate Research Assistant: 11/10 - 11/11,*
Molecular dynamics simulations on graphics processing units. Early contributor to GPU Optimized Monte Carlo (GOMC), an open-source Gibbs ensemble Monte Carlo simulation engine. Wayne State University, Detroit, USA.
- *Graduate Research Assistant: 11/10 - 11/11,*
Developed software for a study conducted by the National Institutes of Health. Wayne State University, Detroit, USA.
- *Undergraduate Research Assistant: 05/08 - 05/09,*
Software engineering role focused on cloud computing with scientific applications. Wayne State University, Detroit, USA.

Publications

Refereed Journal Publications and Preprints

1. Nathaniel Johnston, Rajat Mittal, Vincent Russo, John Watrous "Extended nonlocal games and monogamy-of-entanglement games", *arXiv preprint*:, (2015).
2. Somshubhro Bandypadhyay, Alessandro Cosentino, Nathaniel Johnston, Vincent Russo, John Watrous, Nengkun Yu, "Limitations on Separable Measurements from Cone Programming", *IEEE Transactions on Information Theory*, (Volume:61, Issue: 6), (2015).
3. Srinivasan Arunachalam, Nathaniel Johnston, and Vincent Russo, "Is Absolute Separability Determined by the Partial Transpose?", *Quantum Information & Computation*, 15(7& 8):0694-0720, (2015).
4. David Gosset, Vadym Kliuchnikov, Michelle Mosca, and Vincent Russo, "An Algorithm for the T-count", *Quantum Information & Computation*, Volume 14 Issue 15-16, Pages 1261-1276, (2014).
5. Alessandro Cosentino and Vincent Russo, "Small Sets of Locally Indistinguishable Orthogonal Maximally Entangled States", *Quantum Information & Computation*, Volume 14 Issue 13-14, Pages 1098-1106, (2014).
6. Srinivasan Arunachalam, Abel Molina, and Vincent Russo, "Quantum Hedging in Two-round Prover-verifier Interactions", *arXiv preprint:1310.7954*, (2013).
7. Jason Mick, Eyad Hailat, Vincent Russo, Kamel Rushaidat, Loren Schwiebert, Jeffrey Potoff, "GPU-Accelerated Gibbs Ensemble Monte Carlo Simulations of Lennard-Jonesium", *Computer Physics Communications*, (2013).
8. Eyad Hailat, Jason Mick, Vincent Russo, Kamel Rushaidat, Loren Schwiebert, Jeffrey Potoff "Parallel Monte Carlo Simulation for the Canonical Ensemble on the GPU", *Journal of Parallel and Distributed Computing* (2012)
9. Vincent Russo, Loren Schwiebert, "Beatty Sequences, Fibonacci Sequences, and the Golden Ratio", *Fibonacci Quarterly* **49**, 151–154 (2011)

Proceedings

1. Jason Mick, Jeffrey Potoff, Eyad Hailat, Vincent Russo, Loren Schwiebert, "GPUs for Lennard-Jones and Gibbs Ensemble Monte Carlo Particle Simulations", *GPU Technology Conference (GTC)*, Spring 2012
2. Jason Mick, Jeffrey Potoff, Eyad Hailat, Vincent Russo, Loren Schwiebert, "GPU Accelerated Monte Carlo Simulations in the Gibbs and Canonical Ensembles", *AIChE*, (2011).
3. Jason Mick, Jeffrey Potoff, Eyad Hailat, Vincent Russo, Kamel Rushaidat, Loren Schwiebert, "GPU Accelerated Configurational Bias Monte Carlo Simulations of Linear Alkanes", *AIChE*, (2012).
4. Jason Mick, Jeffrey Potoff, Eyad Hailat, Vincent Russo, Kamel Rushaidat, Loren Schwiebert, "Optimization of a Lennard-Jones Particle Monte Carlo GPU-Code", *AIChE*, (2012).
5. Jason Mick, Jeffrey Potoff, Eyad Hailat, Vincent Russo, Kamel Rushaidat, Loren Schwiebert, "GPU MCMC Developments: CBMC Nonpolar Molecules, Verlet Lists, and Architectural Optimizations", *AIChE*, (2012).

Technical Reports

- Vincent Russo, “Solar Wind Anomalies as Detected by the Fast Imaging Plasma Spectrometer”, *University of Michigan, Space Physics Lab*, (2010).

Presentations

- “Limitations of Separable Measurements from Cone Programming”, poster sessionm QIP 2014.
- “Quantum Hedging in Two-round Prover-verifier Interactions”, poster session, QIP 2013.
- “Small Sets of Locally Indistinguishable Orthogonal Maximally Entangled States”, poster session, QIP 2013.
- “An Algorithm for the T-count”, poster session, QIP 2013.
- “GPU MCMC Developments: CBMC Nonpolar Molecules, Verlet Lists, and Architectural Optimizations”, AICHE, 2012.
- “GPU-Based Monte Carlo Simulations For Canonical and Gibbs Ensembles”, NVIDIA GTC, 2012.

Workshops

- *Quantum Optimization Workshop*, 2014, University of Toronto - Fields Institute.
- *Quantum Key Distribution Summer Workshop*, 2011, University of Waterloo - Institute for Quantum Computing.

Technical Skills

Language / Development Proficiency

- Languages: C/C++/C#, F#, R, Java, Python, Fortran, MATLAB, Mathematica, Maple, Haskell, IDL, \LaTeX
- Operating Systems: Unix/Linux, Windows.

Selected Software

- Bitbucket and Github Repositories ((<https://bitbucket.org/vprusso>) and (<https://github.com/vprusso>))
 - Various open-source software related to papers, scientific computing, and other miscellaneous projects

Minor contributions

- GOMC (GPU Optimized Monte Carlo): <http://gomc.eng.wayne.edu/>
 - Early contributor to open-source GPU-driven molecular dynamic simulation software package. Written in C++ using the CUDA library.
 - Responsible for working along chemistry department and implementing Gibbs ensemble and Lennard Jones simulations ported to the GPU.
- QETLAB (Quantum Entanglement Laboratory): <http://www.qetlab.com/>
 - Contributed a small collection of functions for general purpose quantum information computations.

Major contributions

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Honors & Awards

- *International Doctoral Student Award*, University of Waterloo, 2012.
- *Mathematics Graduate Experience Award*, University of Waterloo, 2012.
- *Institute for Quantum Computing Entrance Award*, University of Waterloo, 2012.
- *David R. Cheriton Graduate Scholarship*, University of Waterloo, 2012.
- *Graduate Professional Scholarship*, Wayne State University, 2011 (Full year tuition scholarship)
- *IT Communities of Practice Award*, General Motors, 2010
- *IT Communities of Practice Award*, National Science Foundation, 2009

Teaching Experience

- CS 343 *Concurrent and Parallel Programming*, TA, 2015-2016.
- CS 436 *Networks and Distributed Computer Systems*, TA, 2015.
- CS 240 *Data Structures and Data Management*, TA, 2014.
- CS 343 *Concurrent and Parallel Programming*, TA, 2013-2014.
- CS 137 *Programming Principles*, TA, Fall 2012.
- CSC 1501 *Discrete Mathematics*, GTA, Winter 2012.
- CSC 1000 *Introduction to Computer Science*, GTA, Winter 2012.
- CSC 2101 *Data Structures and Algorithms*, GTA, Fall 2011.
- CSC 1101, *Problem Solving and Programming*, GTA Winter 2011.
- Intern Researcher, Space Physics Research Lab, University of Michigan 2010.
- Tutor, *All computer science and mathematics undergraduate courses*, Fall 2009-2012.
- Researcher, Department of Computer Science Wayne State University, 2008–2012.

Languages

- English (fluent)
- Spanish (intermediate)
- Japanese (intermediate)

Reference

John Watrous (Advisor, Professor)

- School of Computer Science
University of Waterloo
200 University Avenue West
Waterloo, Ontario
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Michele Mosca (Advisor, Professor, Canada Research Chair)

- Department of Combinatorics & Optimization,
University of Waterloo
200 University Avenue West
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More available upon request.