ZANE ROSSI · ♍

education

personal information

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The University of Chicago — Chicago, IL
Expected B.S. Mathematics, B.A. Physics · June, 2019
GPA: 3.92 · (Major GPA: 4.00) · Mathematics and
Physics Major, Creative Writing Minor
Japanese (4+ years study, High-Intermediate)

fellowships and awards

◆ Fay and Walter Selove Prize (2018) · Awarded supplementary stipend for research with University of Chicago professor: awarded by the Physics department
◆ University of Chicago Student Marshal (2018) · Awarded highest honor conferred to undergraduate students at the University of Chicago: for exceptional academic and community standing in the student's third year
◆ Phi Beta Kappa, Junior Year (2018) · Awarded membership in the Beta Chapter of Illinois (Junior-year selection criteria more rigorous)
◆ FUTI Award (2017) · Awarded stipend for summer research with Katsura group of the University of Tokyo, courtesy of Friends of UTokyo Inc., for use during the University of Tokyo Research Internship Program (UTRIP)
◆ James Franck Institute Summer Fellowship (2016) · Awarded stipend for research with University of Chicago professor: sponsored by the James Franck Institute

work experience

Chong Lab · Chicago, IL   Dec 2017–Present

Computer-Science Research Assistant

◆ Authored Python/C code and analytic theory for the optimal generation of various error-corrective (e.g., Shor code, cat-code) evolution schemes in appropriately coupled systems of qubits with novel models for included noise
◆ Investigated algorithmic complexity of optimal control codes, and authored proof-of-concept models toward an eventual quantum compilation engine capable of efficient creation of simple evolution schemes from finite sets of constituent gates using sparse matrix techniques
◆ Gave weekly informal presentations to group members, and more occasional formal presentations to other members of EPiQC multi-institution consortium, under lead PI, Professor Fred Chong

Katsura Lab · Tokyo, JPN   Jun–Aug 2017

Mathematical Physics Research Assistant

◆ Derived novel entanglement metrics for MBL quantum spin systems exhibiting time-translation symmetry breaking using DMRG principles and a distinctly information theoretic approach
◆ Designed and implemented algorithms based in Vidal's TEBD theory, exponentially reducing time for classical simulation of MBL systems. Drafted and presented weekly lectures to graduate and undergraduate students at the University of Tokyo Hongo campus, and final program report

Guyot-Sionnest Lab · Chicago, IL   Jun–Dec 2016

Computational Physics Research Assistant

◆ Designed, wrote, and tested algorithms to both electromagnetically model behavior of thin-film photovoltaic devices and optimize physical dimensions via metaheuristic search algorithms
◆ Wrote documentation for designed code, formatted theoretical data to be compared with experiment performed by University of Chicago Guyot-Sionnest Lab, and presented these results to colleagues in weekly meetings

Haghighat Lab · Arlington, VA   Jun–Aug 2014, 2015

Computational Physics Intern

◆ Designed and programmed simulations of reactor-pool neutron-scattering with the Virginia Tech Transport Theory Group (VT³G) to optimize heat diffusion characteristics of spent fuel repositories
◆ Prepared presentations and LaTeX reports; authored/supplemented previous FORTRAN/C# for simulations under the PENTRAN modeling framework

leadership and involvement

Mathematics Lecturer
(2015-2018) Author and lecturer of presentations for the societies of mathematics and physics students at the University of Chicago; lectures focus on both introductory, general material and material specific to the lecturer's research.

Reading Program
(2017-2018) Directed reading under the graduate students and principle investigators of both the Schuster and Chong Labs of the University of Chicago, comprising weekly meeting and perusal of modern papers in the area of optimal control theory, specifically the application of machine learning methods to quantum optimal control & error correction.

Writers' Workshop
(2017-2018) President and lead facilitator of the University of Chicago's Writers' Workshop, which offers course-style, student-run fiction and poetry workshops for undergraduate and graduate students, which include both lecture and workshop components. Work includes securing funding, authoring lesson plans on outside texts, and providing guidance & long-form feedback for students during weekly meetings.

University Orchestra
(2016-2018) Oboe player (alternatively first and second position) in the University of Chicago Symphony Orchestra, which performs two concerts per academic quarter (i.e., ten weeks), with up to six hours of rehearsal per week. Classical and modern repertoire.

relevant coursework

Mathematics
Real Analysis · Complex Analysis · Differential Equations · Honors Abstract Algebra · Computability Theory · Mathematical Logic

Physics
Quantum Mechanics · Honors Mechanics, Electrodynamics · Experimental Physics · Graduate General Relativity · Graduate Quantum Information

Computer Science
Artificial Intelligence · Algorithms · Computational Linguistics

additional skills

Programming
Java · Python · Mathematica · HTML/CSS/Javascript/Django · UNIX · Haskell · Tensorflow

Miscellaneous
InDesign · LaTeX · GIMP

Language
Japanese (4+ years of study · high-intermediate)