Jacob **Portes**

jpp2139@columbia.edu • www.columbia.edu/~jpp2139/

Experience

Research Assistant   01/2014 –

Columbia University, Laboratory for Functional Optical Imaging.

- Currently working with Professor Elizabeth Hillman to develop novel nonlinear spatiotemporal models for blood flow in the rat brain using high-resolution optical intrinsic signal imaging (OISI) data. Part-time during school year and full-time during summers. Designed experiments and novel analysis paradigms; acquired, analyzed, and modeled large hemodynamic datasets.

- Presented poster at Society for Neuroscience (SfN) 2014 *A new nonlinear model of the fMRI BOLD response (J. Portes, C. Amoozegar, B.R. Chen, M. Kozberg, M. Shaik, E. Hillman)*

- Results are being written up for paper submission, first authorship: *A spatiotemporal model of functional hyperemia based on endothelial propagation of vasodilation*. Lab website: http://orion.bme.columbia.edu/~hillman/

Teaching Assistant   01/2015 – 05/2015

Columbia University, Department of Computer Science.

- TA for the course **Introduction to Quantum Computing** (CS4281) taught by Professor Anargyros Papageorgiou. Enthusiastically assisted undergraduate and graduate students with course material during weekly office hours, and graded assignments.

Research Assistant   06/2012 – 09/2012

Stanford University, Department of Radiation Oncology

- Worked with Professor Peter Maxim to design radiation therapy optimization program using MATLAB for future research of Very High Energy Electrons (VHEE). Medical physics work involved manipulating patient data and patient treatment plans for particle physics Monte-Carlo simulation packages.

Research Assistant   07/2011 – 09/2011

Stony Brook University, Department of Physics and Astronomy

- Worked with Klaus Dehmelt on a gas control system prototype for future RICH (ring-imaging Cherenkov) detector. Manually worked on the mechanical prototype. Also ran simulations using GEANT4 particle physics software.

Education

Columbia University   09/2013 – 02/2016

- Part-time **M.A., Philosophical Foundations of Physics** (confer February 2016)

- Graduate courses in *Quantum Mechanics, Quantum Field Theory, Philosophy of Quantum Mechanics, Quantum Computing, Statistical Mechanics, Electrodynamics, Theoretical Neuroscience*.

- Individual study course on ab-initio quantum chemistry algorithms for quantum computing with Anargyros Papageorgiou.

- *M.A. Thesis: **Decoherence, Superconducting Qubits, and the Possibility of Scalable Quantum Computing.*** Topics covered – foundations of quantum mechanics, circuit model of quantum computing, Shor's and Grover's algorithms, quantum error correction, the physics of superconducting qubits, decoherence models (e.g. spin-boson model), current superconducting qubit research.

Stanford University   09/2009 – 06/2013

- Two separate degrees in **Physics (B.S.)** and **Philosophy (B.A.)**

- Courses in Physics (incl. Classical and Lagrangian Mechanics, E&M, Quantum Mechanics, and Statistical Mechanics), Mathematics (incl. PDEs and First Order Logic), Computer Science (incl. Java and C++), Electronics, Robotics, Lasers, Ancient and Contemporary Analytic Philosophy, and Philosophy of Science

Projects

- *Electronics*: Designed and built analog circuit from scratch that filtered music and transmitted over 4 feet with flashing LEDs. Worked with a partner over 3 weeks. Project voted best in the class. (PHYS 105)

- *Robotics:* Designed and built automated robot that placed poker chips in bins using sensors. Team of 4 conceptualized and implemented circuits, materials, and code from scratch over 3 weeks. (ME 210)

- *Low Temperature Physics:* Designed and built AC susceptometer and successfully characterized superconducting YBCO thin film. 10-week senior physics lab. Team of 5. (PHYS 108)

Additional

- Programming experience with MATLAB, JAVA, C++, UNIX, GEANT4, Arduino

- Fluent in **Spanish** (native) and **Hebrew**; proficient in **Modern Standard Arabic**