

ISAAC R. STORCH, PH.D.

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PROFILE

Data Scientist with a background in Ad Tech and Experimental Condensed Matter Physics. Inquisitive, analytical, and tenacious, with a passion for problem solving, programming, and optimization. Has excellent communication and inter-personal skills, as exemplified by several collaborative projects in both industry and academia.

EDUCATION

Cornell University August 2015

Ph.D. in Experimental Physics, Minor in Theoretical Physics

University of California, Santa Barbara, College of Creative Studies June 2009

B.S. in Physics, Minor in Mathematics, with highest academic honors

SKILLS

- Programming Languages: Python (numpy, pandas, scikit-learn, matplotlib), SQL, Java, Bash, Matlab
- Processing large data sets (100s of TB) with MapReduce, using Hadoop and Hive
- Proficient in key data science techniques, including feature engineering, model selection, cross-validation, bias-variance tradeoff, and data visualization
- Experience with machine learning algorithms, including neural networks, random forests, linear and logistic regression, anomaly detection, optimization, and dimensionality reduction
- Solid background in mathematics, including linear algebra, multivariate calculus, probability, and statistics

EXPERIENCE

Data Scientist, OpenX, Pasadena, CA January 2016 – Present

- Applied machine learning techniques to optimize and improve OpenX's online advertising exchange
- Prototyped, validated, and productionized scalable models for cutting down on the ~4 trillion daily network calls to advertisers, while maximizing revenue
- Developed a PID controller for applying a capacity-aware threshold to models, so that more traffic is cut during the day, when the network is strained, and less is cut at night
- Defined performance metrics and analyzed results from experiments and A/B tests, resulting in an accurate assessment of models in a production setting
- Conducted research into filtering fraudulent ad requests (a.k.a. "bots") and delivered a report suggesting several potential improvements

Graduate Research Assistant, Cornell University, Ithaca, NY May 2010 – August 2015

Advisor: Professor Paul L. McEuen

- Conducted experiments to investigate the unique mechanical, electrical, and optical properties of graphene, the world's thinnest and strongest material, resulting in a PhD thesis and 4 publications in peer-reviewed journals
- Developed a novel high-yield nano-fabrication process, which produced large, suspended graphene devices with high quality factor
- Invented an optical interferometric technique for non-resonant detection of the position of a graphene sheet, removing the mass as a free parameter in the theoretical model
- Acted as network administrator for the research group and selected a cost-effective data management scheme
- Supervised two undergraduate students in conducting their own research projects

Teaching Assistant, Cornell University, Ithaca, NY August 2009 – May 2010

- Organized and taught weekly discussion and lab sections, wrote quizzes, and graded homework assignments and tests for two undergraduate courses: Physics I (Mechanics) and Electronic Circuits

EXPERIENCE CONT'D

Undergraduate Research Assistant, University of California, Santa Barbara

June 2007 – July 2009

Advisor: Professor John M. Martinis

- Developed and tested a technique for resetting a superconducting quantum bit (qubit) into the ground state
- Used Matlab to simulate the differential equations and concluded that a chirped microwave electrical signal would be sufficient for qubit reset
- Designed and assembled a printed circuit board with custom electronic components to generate the required electrical signal

FELLOWSHIPS AND AWARDS

- National Science Foundation IGERT Fellowship (August 2010 – August 2012)
- Summer Undergraduate Research Fellowship, College of Creative Studies, UCSB (June – August 2007)
- Physics Honor Society: Sigma Pi Sigma (Member since November 2007)

PUBLICATIONS

- **I. R. Storch**, R. De Alba, V. P. Adiga, T. S. Abhilash, R. A. Barton, H. G. Craighead, J. M. Parpia, P. L. McEuen, *Young's Modulus and Thermal Expansion of Tensioned Graphene Membranes* Nano Letters (In Review)
- R. De Alba, F. Massel, **I. R. Storch**, T. S. Abhilash, A. Hui, P. L. McEuen, H. G. Craighead, J. M. Parpia, *Tunable phonon-cavity coupling in graphene membranes*, Nature Nanotechnology 11, 741–746 (2016)
- V. P. Adiga, R. De Alba, **I. R. Storch**, P. A. Yu, B. Ilic, R. A. Barton, S. Lee, J. Hone, P. L. McEuen, J. M. Parpia, and H. G. Craighead, *Simultaneous electrical and optical readout of graphene-coated high Q silicon nitride resonators*, Applied Physics Letters 103, 143103 (2013)
- R. A. Barton, **I. R. Storch**, V. P. Adiga, R. Sakakibara, B. R. Cipriany, B. Ilic, S. P. Wang, P. Ong, P. L. McEuen, J. M. Parpia, and H. G. Craighead, *Photothermal self-oscillation and laser cooling of graphene optomechanical systems*, Nano Letters 12, 4681–4686 (2012)

CONTRIBUTED TALKS

- **I. R. Storch**, R. A. Barton, R. De Alba, V. P. Adiga, H. G. Craighead, J. M. Parpia, and P. L. McEuen, *Mechanical nonlinearity in graphene resonators*, American Physical Society (APS) March Meeting, Denver, CO (March 2014)
- **I. R. Storch**, R. A. Barton, V. P. Adiga, B. Ilic, A. M. van der Zande, W. S. Whitney, J. M. Parpia, H. G. Craighead, and P. L. McEuen, *Graphene drumhead resonators*, Materials Research Society (MRS) Fall Meeting, Boston, MA (November 2011)

POSTER PRESENTATIONS

- **I. R. Storch**, R. De Alba, H. G. Craighead, J. M. Parpia, and P. L. McEuen, *Fabrication of split gate devices for suspended graphene P-N junctions*, Semiconductor Research Corporation (SRC) Institute for Nanoelectronics Discovery and Exploration (INDEX) Onsite Review, Albany, NY (August 2014)
- **I. R. Storch**, V. P. Adiga, R. De Alba, R. A. Barton, H. G. Craighead, J. M. Parpia, and P. L. McEuen, *Temperature dependence of the elastic modulus in graphene resonators due to entropic rippling*, Gordon Research Conferences (GRC), Graphitic Carbon Materials, Chemistry and Physics of, Bates College, Lewiston, ME (June 2014)
- **I. R. Storch**, R. A. Barton, V. P. Adiga, R. Sakakibara, B. R. Cipriany, B. Ilic, S. P. Wang, P. Ong, J. M. Parpia, H. G. Craighead, and P. L. McEuen, *Graphene optomechanical systems*, Gordon Research Conferences (GRC), Graphitic Carbon Materials, Chemistry and Physics of, Davidson College, Davidson, NC (June 2012)