

# ISAAC R. STORCH, PH.D.

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## PROFILE

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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

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### 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

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- 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

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### 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

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## EXPERIENCE CONT'D

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### 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

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## FELLOWSHIPS AND AWARDS

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- 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)

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## PUBLICATIONS

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- **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)

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## CONTRIBUTED TALKS

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- **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)

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## POSTER PRESENTATIONS

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- **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)