

Curriculum Vitæ

November 19, 2017

Personal Information

Rory E. Hartong-Redden
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Education

- **University of California, Santa Barbara** Santa Barbara, CA
MS Mechanical Engineering Dec 2014
– Thesis: *Experimental apparatus for the study of Faraday waves on time-varying domains*
 - **Northwestern University** Evanston, IL
Physics PhD Candidate Sep 2010–Mar 2012
 - **University of California, Santa Barbara** Santa Barbara, CA
BS Physics & BS Mechanical Engineering Jun 2010
– Thesis: *Experimental and theoretical study of pattern identification in physical systems with circular symmetry*
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Awards and Honors

- Graduated with honor in both undergraduate degrees, cumulative GPA: 3.7/4.0
 - Dean's List 11/12 quarters
 - Member: Tau Beta Pi engineering honor society
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Skills

Languages: Python, SQL, MATLAB
Machine Learning: TensorFlow, Keras, XGBoost, scikit-learn
Data: Spark, Hadoop, Postgres, HDF5
Dev Tools: Git, Heroku, PyCharm, AWS
Python Stack: Conda, IPython, Jupyter, matplotlib, NumPy, Pandas, PyTables, SQLAlchemy
Beautiful Typesetting: L^AT_EX

Work Experience

- **Allstate** Menlo Park, CA
Research Analyst Dec 2016–Present
– Contribute to research with Stanford Intelligent Systems Laboratory
– Prepare datasets using SQL, Python, Spark, Hadoop
- **Startup.ML** San Francisco, CA
Machine Learning Fellow Dec 2015–Apr 2016
– Developed a production FinTech data pipeline for currency trading using industry-standard machine learning methods
– Investigating how Reinforcement Learning can be leveraged for improved algorithmic trading
- **Harold Washington College** Chicago, IL
Adjunct Faculty Feb 2015–May 2015

- Gave 2 lectures a week for a descriptive astronomy course
 - Incorporated the latest discoveries in astronomy and the new *Cosmos* into my lessons
 - Presented topics in Astrophysics and Cosmology at the level of the general public and explained concepts without relying on mathematical or scientific constructs
 - **University of California, Santa Barbara** Santa Barbara, CA
Teaching Assistant *Dec 2012–Jun 2014*
 - Introduced machining concepts on the mill and lathe to students in the engineering machine shop
 - Supervised students as they built parts for the class project with zero accidents
 - **Northwestern University** Evanston, IL
Teaching Assistant *Sept 2010–Mar 2012*
 - Prepared quizzes and held office hours to answer questions one-on-one for introductory physics
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Projects

- **Kaggle** *May 2015–Present*
 - Coded a deep residual convolution network in Keras/TensorFlow for multi-label classification for the Yelp Kaggle competition [yelp-kaggle repository]
- **Software Development** *May 2015–Present*
 - Currently working through *Bayesian Methods for Hackers*
 - Learned object-oriented programming and wrote code using OO principles
 - Deployed a Twitter clone in Rails on Heroku by following the *Ruby on Rails Tutorial*
- **Master’s Thesis: Faraday Waves** Santa Barbara, CA
Krechetnikov Fluid Physics Lab *Dec 2013–Jun 2014*
 - Designed and built a new experiment to study the surface patterns of vibrating containers of water (Faraday waves)
 - Incorporated a recent image processing technique for cheap 3D high speed mm-resolution measurement over a surface area of 225 cm^2 [profilometry repository]
 - Sourced \$20k in lab equipment including a Labworks 75lb shaker, 2 accelerometers, and 2 Parker actuators all interfacing with a NI PCIe DAQ and LabVIEW VI running on a dedicated computer
 - Designed a bespoke experimental apparatus using SolidWorks to study Faraday Waves and produced a set of engineering drawings, validation tests, and documentation as part of my thesis
 - Personally fabricated a prototype in the college machine shop and had the final design parts CNC machined
- **X-Ray Microscopy** Argonne National Lab
Bionanoprobe, Advanced Photon Source, Sector 21 *Nov 2011*
 - Measured the thermal drift of the optics stage of the BioNanoProbe using simple image correlation with Matlab
- **Arctic Sea Ice Modeling** Northwestern University
Prof. Mary Silber, Dept. of Applied Mathematics *Sep 2011–Jan 2012*
 - Derived from first principles and coded arctic sea ice models in Matlab for the study of climate change
- **Programmable Flow Generator** Goleta, CA
LaunchPoint Technologies *Sep 2009–Jun 2010*
 - Contributed modeling expertise on team of fellow engineering students working on a fluidic loop
- **Bachelor’s Thesis: Drop Splash Experiment** Santa Barbara, CA
Krechetnikov Fluid Physics Lab, Dept. of Mechanical Engineering *Jul 2009–Oct 2010*
 - Investigated the physics of splashes that occur when a liquid droplet impacts a wetted surface
 - Performed stereo triangulation in MATLAB, reduced the 3D data, and searched for patterns using my theory of pattern identification [drop.splash repository]
 - Published a peer-reviewed article³ on the experimental and theoretical advances I developed that may have solved a 100-year puzzle in fluid dynamics

- **Transient Optical Sky Survey**

Lubin Lab, Dept. of Physics

Santa Barbara, CA

Sep 2008–Jun 2009

- Collaborated on the MATLAB/C data pipeline that processed 1GB of images per night
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Publications

1. R. Hartong-Redden. *Experimental apparatus for the study of Farady waves on time-dependent domains*. Master's thesis, University of California, Santa Barbara, 2014.
 2. E. Hadjiyska, G. Hughes, P. Lubin, S. Taylor, R. Hartong-Redden, and J. Zierten. *The transient optical sky survey data pipeline*. New Astronomy, 2013.
 3. R. Hartong-Redden and R. Krechetnikov. *Pattern identification in systems with $S(1)$ symmetry*. Physical Review E, 2011.
 4. R. Hartong-Redden and R. Krechetnikov. *Experimental and theoretical study of pattern identification in physical systems on circular domains*. Annual Meeting of the APS Division of Fluid Dynamics, 2010.
 5. R. Hartong-Redden. *Experimental and theoretical study of pattern identification in systems with $O(2)$ symmetry*. Bachelor's thesis, University of California, Santa Barbara, 2010.
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