

# Curriculum Vitæ

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## Personal Information

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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 Mechanical Engineering* Jun 2010
  - **University of California, Santa Barbara** Santa Barbara, CA  
*BS Physics* 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  
**Machine Learning:** scikit-learn, TensorFlow  
**Data:** Spark, Hadoop, Postgres  
**Dev Tools:** Jupyter Notebooks, Bash, Git, Sublime Text  
**Python Stack:** Pandas, matplotlib, SQLAlchemy

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## Work Experience

- **Allstate** Menlo Park, CA  
*Data Scientist* Jul 2016–Present  
– Guide and support ongoing partnership with the Stanford Intelligent Systems Laboratory  
– Prepare internal datasets for business analysts  
– Ad hoc scripting, analysis, and problem solving
- **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–Jul 2016*
  - Coded a deep residual convolution network in Keras/TensorFlow for multi-label classification for the Yelp Kaggle competition
- **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  $225\text{ cm}^2$
  - 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 the 3D data, and searched for patterns using my theory of pattern identification
  - Published a peer-reviewed article<sup>3</sup> on the experimental and theoretical advances I developed that may have solved a 100-year puzzle in fluid dynamics
  - **Transient Optical Sky Survey** Santa Barbara, CA  
*Lubin Lab, Dept. of Physics*  
*Sep 2008–Jun 2009*
    - Collaborated on the MATLAB/C data pipeline that processed 1GB of images per night
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## Publications

1. B. Wulfe, S. Chintakindi, S.C. Choi, R. Hartong-Redden, A. Kodali, M.. Kochenderfer. *Real-time Prediction of Intermediate-Horizon Automotive Collision*. CoRR. 2018.
  2. R. Hartong-Redden. *Experimental apparatus for the study of Farady waves on time-dependent domains*. Master's thesis, University of California, Santa Barbara, 2014.
  3. E. Hadjiyska, G. Hughes, P. Lubin, S. Taylor, R. Hartong-Redden, and J. Zierten. *The transient optical sky survey data pipeline*. New Astronomy, 2013.
  4. R. Hartong-Redden and R. Krechetnikov. *Pattern identification in systems with  $S(1)$  symmetry*. Physical Review E, 2011.
  5. 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.
  6. 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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