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*

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

Skills

Languages: Python, SQL, MATLAB, Elixir
Machine Learning: scikit-learn, SparkML, XGBoost, TensorFlow
Data: Spark, Hadoop, Postgres, PostGIS
Data Engineering: Oozie, Airflow, Kafka, Flume
Dev Tools: Jupyter Notebooks, Bash, Git, Sublime Text
Python Stack: Pandas, matplotlib, SQLAlchemy, Flask, scikit-learn, requests, pytest

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Work Experience

- **SyBridge (acquired Fast Radius)** — Boulder, CO
  Data Science Manager — *Aug 2021–Present*
  - Leading the data science team, expanded the manufacturing technologies covered to include CNC and plastic molding
- **Fast Radius** — Chicago, IL
  Data Scientist — *Feb 2020–Present*
  - Tech stack: Python, Elixir, Docker, AWS ECS

- Develop machine learning micro-services (sometimes without ML) in Python to facilitate internal processes around costing and quoting

- **Runtastic** Linz, Austria
  Data Engineer *Oct 2018–Sep 2019*
  - Data engineering stack: Python, Spark, Hadoop, Flume, Oozie, Hive, SQL
  - Led the design and deployment of a "People You Might Know" data product using Spark, scikit-learn, SparkML, and Elasticsearch
  - Payed off technical debt and simplified the setup while maintaining uptime of company dashboards

- **Allstate** Menlo Park, CA
  Data Scientist *Jul 2016–Sep 2018*
  - 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 $225\,\mathrm{cm}^2$
  - 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[3] 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 and Patents

1. W. King, D. Arwine, A. Brenzel, K. Green, C. Kampfe, P. McCusker, J. Nanry, M. Newberger, D. Pick, G. Pinto, L. Rassey, Duru Turkoglu, M. Weckel, C. Wood, R. Hartong-Redden, T. Gossett. *Manufacturing and development platform.* Patent Pending. 2021.
2. B. Wulfe, S. Chintakindi, S.C. Choi, R. Hartong-Redden, A. Kodali, M.. Kochenderfer. *Real-time Prediction of Intermediate-Horizon Automotive Collision.* CoRR. 2018.
3. R. Hartong-Redden. *Experimental apparatus for the study of Farady waves on time-dependent domains.* Master's thesis, University of California, Santa Barbara, 2014.
4. E. Hadjiyska, G. Hughes, P. Lubin, S. Taylor, R. Hartong-Redden, and J. Zierten. *The transient optical sky survey data pipeline.* New Astronomy, 2013.
5. R. Hartong-Redden and R. Krechetnikov. *Pattern identification in systems with S(1) symmetry.* Physical Review E, 2011.
6. 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.
7. 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.
