

Curriculum Vitæ

October 30, 2024

Personal Information

Rory 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 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

Programming Languages: Python, SQL, R, MATLAB, Elixir, JavaScript, Rust

Machine Learning: scikit-learn, SparkML, XGBoost, TensorFlow, Keras

Data: Spark, Hadoop, Postgres, PostGIS, S3

Data Engineering: Oozie, Airflow, Kafka, Flume

Dev Tools: Jupyter Notebooks, Bash, Git, GitHub, CI/CD, AWS, Terraform

Python Stack: Pandas, matplotlib, SQLAlchemy, Flask, scikit-learn, requests, pytest

Work Experience

- **SyBridge Technologies (Fast Radius)** Boulder, CO
Technical Manager Aug 2021–May 2024
 - Leading the data science team as we expand and improve models that instantly quote parts
 - Ensured high availability of revenue-critical APIs through high-quality code, comprehensive test suites, and synthetic Datadog tests in production
 - Created SQL queries in Metabase to extract and analyze data, monitor model performance, create dashboards, and answer business questions
 - Predicted shipping costs using mixed integer programming and the UPS API

- Supported R&D initiatives with statistical analysis and visualization of varied data such as accelerometer, temperature readings, and CAD file sizes using Jupyter Notebooks with Python
- Worked with cross-functional teams to align on manufacturing process cost models

- **Fast Radius**

Data Scientist

Chicago, IL

Feb 2020–Present

- Tech stack: Python, Elixir, Docker, AWS ECS
- Founding data scientist: developed, deployed, and maintained the first cost-prediction regression models, contributing to the early growth of the platform
- Contributed to the “Manufacturing and Development Platform” patent, laying the groundwork for the company’s software architecture

- **Runtastic**

Data Engineer

Linz, Austria

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
- Built an ETL pipeline to anonymize customer data for GDPR compliance

- **Allstate**

Research Analyst

Menlo Park, CA

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**

Machine Learning Fellow

San Francisco, CA

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**

Adjunct Faculty

Chicago, IL

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**

Teaching Assistant

Santa Barbara, CA

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**

Teaching Assistant

Evanston, IL

Sept 2010–Mar 2012

- Prepared quizzes and held office hours to answer questions one-on-one for introductory physics

Projects

- **Master's Thesis: Faraday Waves** Santa Barbara, CA
Dec 2013–Jun 2014
Krechetnikov Fluid Physics Lab
 - 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
 - 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
Nov 2011
Bionanoprobe, Advanced Photon Source, Sector 21
 - Measured the thermal drift of the optics stage of the BioNanoProbe using simple image correlation with Matlab
 - **Arctic Sea Ice Modeling** Northwestern University
Sep 2011–Jan 2012
Prof. Mary Silber, Dept. of Applied Mathematics
 - Derived from first principles and coded arctic sea ice models in Matlab for the study of climate change
 - **Programmable Flow Generator** Goleta, CA
Sep 2009–Jun 2010
LaunchPoint Technologies
 - Contributed modeling expertise on team of fellow engineering students working on a fluidic loop
 - **Bachelor's Thesis: Drop Splash Experiment** Santa Barbara, CA
Jul 2009–Oct 2010
Krechetnikov Fluid Physics Lab, Dept. of Mechanical Engineering
 - 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
 - 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** Santa Barbara, CA
Sep 2008–Jun 2009
Lubin Lab, Dept. of Physics
 - 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. 2024.
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.
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