

RAY HAGIMOTO

Computational Physics PhD

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Address: Danville, IL

PROFILE

Computational physics PhD with 5 years of data analysis and Python programming experience. Seeking quantitatively complex challenges in industry. Experienced with Monte Carlo simulations and statistical inference on real data.

Skills: Python, C++, PyMC, TensorFlow, Pandas, scikit-learn, Linux, git, SQL, LightGBM, Bayesian inference, MCMC, Docker

EDUCATION

Rice University, Houston, TX

Aug 2020 - Dec 2024

Doctor of Philosophy (Ph.D.) in Physics, (GPA: 3.90)

- * Designed Bayesian inference pipelines with PyMC and TensorFlow for parameter recovery from cosmological data
- * Trained spherical CNNs to extract physical parameters from simulated CMB sky maps
- * Constructed simulation-based estimation pipelines with Monte Carlo methods across 150,000+ samples using HPC clusters
- * Published 4 papers, in top-tier journals, including 1 first-author, on cosmological inference using Bayesian models

University of Texas at San Antonio, San Antonio, TX

Aug 2016 - May 2020

Bachelor of Science (B.Sc.) in Physics, (GPA: 4.00)

- * Completed coursework in advanced physics, linear algebra, multivariable calculus, and differential equations

EXPERIENCE

Susquehanna International Group (SIG)

Jun 2024 - Aug 2024

Quantitative Researcher PhD Intern, Bala Cynwyd, PA

- * Built predictive **boosted decision tree** models using **LightGBM** for simulated high-frequency trading tasks, improving PnL performance by 500% over a baseline model
- * Designed rolling train-validation-test pipelines and monitored residuals for model evaluation
- * Used **SHAP** values to guide feature engineering for boosted decision trees
- * Underwent options trading education, including the **Black-Scholes model and risk neutral pricing**

University of Chicago

Jun 2019 - Sep 2019

Undergraduate Summer Researcher, Chicago, IL

- * Developed Python tools for analyzing astrophysical correlation functions in cosmic microwave background data
- * Co-authored a peer-reviewed publication in a high impact journal, *The Astrophysical Journal Letters*

PROJECTS

Real-Time Anomaly Detection System

2025

Independent R&D Project, Remote

- * Designed and deployed a serverless detection pipeline using **AWS Lambda**, **S3**, and **OpenCV** for wildlife monitoring
- * Engineered real-time **anomaly detection** from image data using luminance thresholding and contour heuristics
- * Implemented background subtraction with exponential moving averages and feature-based scoring of object contours
- * Integrated presigned S3 uploads from Android devices and automated inference triggers via Lambda event handling
- * Deployed Telegram bot for annotated image alerts with sub-second latency from upload to user notification

LEADERSHIP

Vice President, Physics and Astronomy Graduate Student Association, Rice University

2022 - 2023

- * Led professional development events and mentored early-stage graduate students in research navigation

Vice President, Society of Physics Students, UTSA

2019 - 2020

- * Founded mentorship initiative and organized funding to support student conference participation

AWARDS

- * NSF Graduate Research Fellowship Honorable Mention (2021)
- * Rice University Dean's Fellowship (2020-2024)