

# RAY HAGIMOTO

Computational Physics PhD

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Address: Danville, IL

## PROFILE

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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

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**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

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**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

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**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

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**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

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