

# Heramba (Hebu) Patil

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## Education

### California Institute of Technology

Sept 2023 – June 2027

B.S Computer Science and Economics (Double Major), GPA: 4.0/4.0

- Activities: Student Investment Fund, Quant Club, Hacktech Outreach Director, Poker Club, NCAA D3 Men's Water Polo.
- Relevant Coursework: Algorithms, Applied Linear Algebra, Discrete Math, Deep Learning, Learning Systems, Machine Learning and Data Mining, Probability and Statistics, Game Theory

## Experience

### Quantitative Trading Intern

Oct 2024 – Present

Pareto Technologies

New York, NY (Remote)

- Part of intraday CME desk researching systematic trend following, volume-weighted, and range breakout strategies for futures and equities.
- Focusing on proprietary edge quantification processes (KPIs), pass rates, and polarization speed to optimize scalability and capital efficiency.
- Maintaining flexibility in beta while employing risk management through drawdown models and equity guards.

### Causal Inference Researcher

Oct 2024 – Present

Northwestern University

Chicago, IL

- Identifying methods to estimate unobserved confounders in causal inference using observable proxies.
- Developing Random Forest machine learning model for measurement error correction in estimating proxies alongside designing synthetic datasets to generate nonlinear distributions.
- Submitting paper to the Conference on Uncertainty in Artificial Intelligence (UAI) 2025.

### Machine Learning Researcher

April 2024 – Oct 2024

California Institute of Technology

Pasadena, CA

- Leveraging deep learning for artifact detection, transient source identification, and celestial event classification on the NASA Nancy Grace Roman Telescope.
- Responsible for creating autoencoder network using TensorFlow into one pipeline unique to Roman.
- Selected as Taylor Lawrence SURF Research Fellow working alongside Dr. Ashish Mahabal as part of RAPID (Roman Alerts Promptly from Image Differencing) team at IPAC in relation with NASA, JPL, and NSF.

### Particle Physics Researcher

June 2022 – July 2023

University of Washington

Seattle, WA

- Identifying semi-visible dark matter jets in proton collisions recorded from CERN collider experiments.
- Developed a boosted decision tree machine learning model using PyTorch and XGBoost.
- Worked in Nobel Prize winning EPE (Elementary Particle Experiment) group under Dr. Shih-Chieh Hsu and presented research at the UW EPE Symposium.

## Skills

**Programming Languages** – Python, C++, MATLAB, Java, C#, OCaml, SQL

**Tools and Frameworks** – TensorFlow, PyTorch, Mathematica, Git, NinjaTrader, Scikit-Learn

## Honors and Awards

Connect Fellow (NYC) – *DE Shaw*

Sept 2024

Summer Invitational Datathon, Competitor – *Citadel*

Aug 2024

SCIAC All-Academic Team – *Southern California Academic Conference*

Jun 2024

Jump Trading / DRW Poker Tournament, Top 15 – *Caltech*

Feb 2024

Jane Street Estimathon, 4th Place – *Caltech*

Feb 2024

USACO Gold – *USA Computing Olympiad*

Dec 2022

IB Diploma Recipient – *International Baccalaureate*

July 2022