

Harjas Sandhu

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EDUCATION

The University of Chicago

Chicago, IL

Bachelor of Arts in Physics

Expected, June 2025

- Cumulative GPA: 3.7/4.0
- Relevant Coursework: Computational Techniques in Astrophysics (Machine Learning), Mathematics of Quantum Mechanics (Linear Algebra), Introduction to Mathematical Probability, Statistical Models and Methods (in progress)

SKILLS

Languages: Python, JavaScript, TypeScript, SQL, CSS, HTML, Java

Frameworks/Libraries: NumPy, Pandas, Matplotlib, scikit-learn, Transformers, Keras, TensorFlow

WORK EXPERIENCE

NanoPattern Technologies – Chicago, IL

June 2024 – August 2024

Nanomaterials Research Intern

- Programmed LED testing system setup to stress 96 LEDs in parallel using **Python**, driving 80% decrease in man-hours required for semiconductor nanocrystal accelerated life testing
- Created data visualization of quantum dot aging/decay in **Matplotlib**
- Automated data modeling of thousands of data points over 956 hours of aging using **NumPy** and **Excel**

University of Chicago Department of Astronomy and Astrophysics – Chicago, IL

March 2024 – Present

Research Assistant under Chihway Chang, Ph.D., Eric Baxter, Ph.D.

- Converted galactic **HealPix** skymap of 857 GHz cosmic background radiation into useable data
- Generated a 30,000-image training set for a machine learning model using **NumPy**, **HealPy**, and **Matplotlib**

Indo Premier Sekuritas – Jakarta, Indonesia

July 2023 – August 2023

Machine Learning Research Intern

- Processed datasets for natural language processing using **Pandas**, **NumPy**, **scikit-learn**, and **Hugging Face Transformers**, augmenting from 6,000 to 30,000 data points without loss of accuracy/overfitting
- Fine-tuned BERT model to classify news headlines by financial relevance with 90+% accuracy using **PyTorch**, analyzing performance with statistics/data visualization using **Matplotlib** and **scikit-learn**

University of Chicago Department of Mathematics – Chicago, IL

December 2022 – June 2023

Teaching Assistant

- Achieved a student pass rate of 100% compared to overall course rate of 80%

PROJECTS

GAN Generation of Galaxy Images | *Python, TensorFlow, Keras, Google Compute Engine*

February 2024

- Designed, implemented, and trained a **Generative Adversarial Network** to generate images of galaxies
- Computed on the cloud with **Google Compute Engine**, **TensorFlow**, and **Keras**

Retirement Calculator | *Java, TypeScript, HTML, CSS, Tailwind, Git, Axios*

August 2024

- Built **Retirement Calculator**, a **full-stack** web app for retirement financial planning
- Integrated **Axios** library to send information between **TypeScript** and **Tailwind** frontend
- Implemented backend logic in **Java** to derive attributes from request body of financial parameters

LEADERSHIP & HOBBIES

- Vice President of the University Gymnastics Club, D&D Game Master for a party of 4 since 2022
- Top 3 Super Smash Bros. Ultimate player in UChi Smash, currently learning Riichi Mahjong