Franklin Wang

(650) 223-4390 @ fxwang@mit.edu

Links

GitHub **frankxwang**
Linkedin **frankxwang**
ORCID **0000-0003-4488-7355**

Education

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

2022 - 2026

PALO ALTO HIGH SCHOOL

2018 - 2022

Notable Coursework

FOOTHILL COLLEGE

Multivariable Calculus
Linear Algebra
Differential Equations
Discrete Math

DEEPLEARNING.AI

Completed Andrew Ng's **deeplearning.ai**
5 part specialization course on Coursera

Skills

PROGRAMMING LANGUAGES

Python • Java • C++ • C#

ML/DATA SCIENCE LIBRARIES

TensorFlow • Keras • NumPy • SciPy • Pandas • Scikit-image • Scikit-learn

Awards

INTERNATIONAL SCIENCE AND ENGINEERING FAIR 2021

- 1st Place in Physics & Astronomy
- Peggy Scripps Award for Best Science Communication

DAVIDSON FELLOW LAUREATE 2021

- Received top $50K scholarship for machine learning asteroid detection research project
- Awarded to only the top 4 projects

USA COMPUTING OLYMPIAD

- Ranked in the top 100 for the 2020 US Open contest for the Platinum (highest) division
- Experienced with Java and C++ for competitive programming

Research

FAINT, FAST-MOVING ASTEROID STREAK DETECTION

2019 - 2022 **Links:** **GitHub Repo** **arXiv PDF** **DOI**

- Research paper published in the Monthly Notices of the Royal Astronomical Society Journal (first author) and was presented at the **AAS 240 Conference**
- Developed a novel algorithm which utilizes Convolutional Neural Networks and a purely synthetic dataset to find fast moving near-Earth asteroids in CCD telescope data
- Detected six previously undiscovered asteroids in just four nights of data from the Zwicky Transient Facility which were missed by ZTF's own detection algorithms
- Improved upon ZTF's previous research by creating a near-Earth asteroid detection approach that does not require any real image data, removing the need for heavy amounts of manual data collection and annotation

ORBIT DETERMINATION OF 2004 LJ1 WITH THE SUMMER SCIENCE PROGRAM

Summer 2021 **Links:** **GitHub Repo**

- Wrote Method of Gauss program in Python to find orbit of potentially hazardous asteroid 2004 LJ1 using observations made from Sierra Remote Observatories & Central Washington University
- Used approaches such as iterative optimization, Newton's method, Taylor series, least-squares, Monte Carlo sampling

Work Experience

NLP RESEARCH INTERN AT UNIPHORE

Summer 2022

- Contrastively train Bi-LSTM model using TensorFlow to improve sentence embeddings for empathy detection in call center transcripts
- Experiment with multimodal (audio + text) models for emotion prediction

SOFTWARE INTERN AT NOAH MEDICAL

Summer 2020

- Used C++ and C# for mesh decimation, sensor tracking & registration, navigation visualization, and sensor accuracy evaluation
- Worked frequently with quaternions, rotation matrices, and vectors

APPLE PI DEEP LEARNING CLASS INSTRUCTOR

2020 - 2022

- Created and taught the curriculum which made complex topics in deep learning like gradient descent and linear algebra accessible to high school students

Other Programming Projects

VISUAL ML

Links: **GitHub Repo** **Website**

- An online neural network sandbox that allows users to create and train convolutional neural nets without needing to know how to code

FIRSTSTEP.ID

Links: **GitHub Repo** **Website** **Writeup by #cut50**

- FirstStep.id is a website that allows those who have recently been released from jail to figure out what forms of identification they may need to apply for (State ID, Driver's License, etc)
- Work with the #cut50 nonprofit, created the backend using Flask and Python
- Won 1st place at the Second Chances Empathy Hackathon at Santa Clara University