

EDUCATION

Stanford University

MS in Statistics

Stanford, CA

June 2022

Stanford University

BS in Mathematical and Computational Science

Stanford, CA

June 2021

EXPERIENCE

Graduate Research Assistant

June 2021 – Present

Stanford Human Trafficking Data Lab

Stanford, CA

- Developed a containerized, distributed, cloud-native data pipeline to process hundreds of thousands of square kilometers of satellite imagery daily (Docker, Kubernetes, Redis, RabbitMQ, Google Cloud Platform).
- Developed a computer vision algorithm to identify remote commodity production sites using satellite imagery (PyTorch, GDAL).
- System will be used by law enforcement to proactively identify locations where forced labor is being used.
- Article about our work here.
- Papers forthcoming.

Research Assistant

June 2020 – June 2021

Stanford Center for Ocean Solutions

Stanford, CA

- Created a deep-learning-based computer vision algorithm to identify small fishing vessels in satellite imagery (PyTorch, GDAL, OpenCV).
- Analyzed entire near-shore region of the Peruvian EEZ and identified previously unknown locations where illegal, unreported, or unregulated fishing was occurring (Google Cloud Platform, Statsmodels, R).
- Code available here.
- Article about my work here.
- Paper forthcoming.

Mathematics Tutor

September 2018 – June 2019

Stanford University Mathematical Organization

Stanford, CA

- Tutored Stanford students taking classes in linear algebra, vector calculus, and differential equations.

PROJECTS

Light-Pipe | *Python, Flask, GDAL, PyTorch, Tensorflow, Celery*

- A Python framework designed to facilitate the deployment of geospatial data pipelines at scale.
- Provides platform-agnostic API for efficient ETL with cloud-optimized geotiffs.
- Allows for model training with heterogeneous geospatial data sources and formats.
- Handles task scheduling and queuing to facilitate distributed processing of geospatial data.
- Facilitates data ingest from major data providers.

“Weak Supervision with Incremental Source Accuracy Estimation”

- Developed a method to estimate the dependency structure and accuracy of weak supervision sources incrementally using precision matrices and robust principal components analysis.
- Allows for model training with weakly-supervised training data in on-line settings.
- Preprint available here.
- Code available here.

“Effect of Behavioral Factors on Average Heart Rate During Cardiovascular Exercise”

- Designed a resolution IV fractional factorial experiment to determine whether certain behavioral factors affect average heart rate during cardiovascular exercise.
- Found that four of the two factors tested were associated with a significant effect on average heart rate during exercise.
- Paper, data, and code available here.

SKILLS

Languages: Python, C++, SQL, R, BASH

Tools: Git, Docker, Kubernetes, Apache Airflow, Apache Spark, Argo, PostgreSQL, PostGIS, Rabbit MQ, Redis, Google Cloud Platform, RESTful APIs

Libraries: Flask, Celery, GDAL, Rasterio, Pytorch, Tensorflow, Scikit-Learn, OpenCV, Statsmodels, Numpy, Pandas

AWARDS

National Merit Scholar

April 2017