

Cristian A. Espinosa

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EDUCATION

University of California, Merced

Merced, CA

Bachelor of Science, Computer Science & Engineering

August 2019 - May 2024

Bachelor of Science, Applied Mathematics (emphasis in Data Analysis)

August 2019 - May 2024

TECHNICAL SKILLS

Programming Languages: Python, JavaScript, C++, SQL, MATLAB, HTML5, CSS, LaTeX

Libraries and Tools: PyTorch, TensorFlow, Scikit-Learn, Pandas, Numpy, OpenCV, Flask, SQLite, Git

Machine Learning Architectures: CNN, Cascade, Decision Tree, CART, Random Forest, GAN

WORK EXPERIENCE

UC Merced - Summer Undergraduate Research Institute

Merced, CA

Student Data Scientist

June 2023 - August 2023

- Built a Generative Adversarial Network (GAN) to synthesize face emotion images
- Conducted training on two classification models, utilizing synthetic and authentic image datasets respectively
- Evaluated the classification efficacy of both models with genuine images and visualized classification accuracy results in Python
- Results showed the model trained with real data outperformed the other model by 30% classification accuracy
- Presented findings and results at UC Merced's Summer Symposium

Lawrence Livermore National Laboratory

Remote

Fellow Data Scientist

May 2022 - April 2023

- Assisted with environment implementation of a nuclear deterrence game for a reinforcement learning agent
- Trained this agent with the Policy-Space Response Oracles (PSRO) algorithm to play the nuclear deterrence game
- Found that the agent avoided the worst outcome of the game 97% of the time

Lawrence Berkeley National Laboratory - Joint Genome Institute

Remote

Student Data Scientist

June 2021 - August 2021

- Produced gene-sequencing plant data from root-colonizing bacteria using Bash scripts
- Performed data visualization of resulting sequencing data with Python
- Discovered that 40% of the root-colonizing bacteria are crucial for plant growth

PROJECTS

- **Anomaleaf [Python]**, Collaborating with a group of students and a mentor from OMRON Inc. to build a mobile application to detect anomalies in leaves. Trained multiple models in Python to classify leaf anomalies and performed model selection. We then processed image dataset to improve the model classification performance. Final product to be presented at Innovate To Grow (I2G) event at UC Merced. [GitHub](#)
- **Tree Algorithm Visualizer [HTML5, CSS, JavaScript]**, Collaborating with professor Miguel Carreira-Perpinan to build a web application to visualize machine learning tree algorithms. Wrote CART and Random Forest algorithms from scratch in JavaScript. Resulting web application was presented at UC Merced's Research Week event. Currently working on making this web application available to the public. [GitHub](#)
- **MusicPie [HTML5, CSS, JavaScript, Python, SQLite]**, Built and published a [website](#) with Flask to recommend music based on the user's face-emotion expression. Used OpenCV's Cascade model to detect the user's face. Then trained a model with TensorFlow to classify up to 7 different face-emotions. Music data was downloaded from Kaggle and stored into a database through SQLite. [GitHub](#)

COURSEWORK

Algorithm Design & Analysis, Data Structures, Software Engineering, Database Systems, Full-Stack Web Development, Intro to Machine Learning, Modern Applied Statistics, Mathematical Methods for Optimization.

OTHER EXPERIENCE & SKILLS

- **STEM Tutor [Leadership, Communication]** at UC Merced January 2020 - May 2023
- **Taiko Captain [Leadership, Communication]** at Yamabuki Taiko Club August 2021 - May 2023
- **Enumerator [Communication]** at U.S. Census Bureau July 2020 - August 2020