JOSE A. SEQUEIRA SANCHEZ

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EDUCATION

University of Kentucky **Lexington, KY**

Bachelor of Science in Computer Science | GPA: 4.0 **(100%)** *Aug 2022- May 2025*

Minors in Statistics and Mathematics

PROFESSIONAL RESEARCH EXPERIENCE

University of Kentucky- EduceLab (Dr. Brent Seales) *08/2024- Present*

Undergraduate Research Assistant

- Developing a machine learning pipeline to enhance the readability of Herculaneum scrolls by predicting the optimal contrast transformation for ancient texts.
- Addressing class imbalance by generating synthetic data, creating overlapping sub-images to emphasize key regions with high papyrological significance.
- Leveraging Convolutional Neural Networks to predict whole-image contrast transformations by aggregating sub-image predictions.

University of Kentucky- NISP Lab (Dr. Jihye Bae) *01/2024- 04/2024*

Undergraduate Research Assistant

- Applied machine learning algorithms (SVM, Neural Networks, KNN, and Regression) to investigate socioeconomic factors influencing colorectal cancer (CRC) prevalence.
- Conducted model evaluations using a comprehensive set of performance metrics to assess predictive validity.

University of Kentucky- Dept. of Forestry and Natural Resources (Dr. Gostch) *08/2023 – 01/2024*

Undergraduate Research Assistant

- Led data cleaning and error correction for climate change research on tree populations in Costa Rica, ensuring sensor data integrity.
- Identified and addressed data inconsistencies caused by environmental factors (rain, wind, earthquakes) through pattern analysis across multiple sensors per tree.
- Incorporated seasonal trends, such as the Costa Rican rainy season, into the cleaning process to enhance the reliability of climate data for ecological studies.

PERSONAL PROJECTS AND RESEARCH

Comparative Analysis of Social Insecurity Levels in Costa Rica and Selected Countries

Objective: Analyze safety and security data across Central American countries to assess trends and impacts on Costa Rica, with the goal of assessing the true impact of the new presidency and its administration.

- Utilized the Difference in Difference method to assess the impact of the new presidential administration on Costa Rica's safety and security by comparing pre- and post-policy periods with neighboring countries as controls.
- Applied country-level fixed effects to control for time-invariant factors, ensuring more accurate isolation of the policy's impact across Central American countries.
- Clustered countries in the region to improve comparative analysis and minimize external biases.
- Executed data preprocessing tasks, and prepared time-series data for causal analysis.
- Visualized year-over-year safety trends with Matplotlib to identify patterns and contrasts between treated (Costa Rica) and control (neighboring countries) units, supporting the causal narrative.

Prediction of UFC Fight Outcomes Using Neural Networks and Data Preprocessing Techniques

Objective: Develop a machine learning model to predict the outcome of UFC fights, leveraging fight data and neural network architectures.

- Executed extensive data cleaning and preprocessing, including removal of irrelevant features.
- Applied feature selection by filtering fighters by gender and weight class to control for variability and confounding effects in model predictions.
- Achieved a model accuracy of approximately 72% in predicting fight outcomes.