

# MADHAN JEGANATHAN

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## EDUCATION

**University of California, Santa Barbara (UCSB)**, Santa Barbara, CA

2021 - 2023

**Bachelor of Science (BS), Statistics and Data Science**

- **Relevant Coursework:** Statistical Machine Learning, Big Data Analytics, Regression Analysis, Bayes Data Analysis, Design of Experiments, SAS Base Programming, Stochastic Processes, Time Series, Probability and Statistics

## PROJECT EXPERIENCE

**World Happiness Exploration**, UCSB, Santa Barbara

June 2023

- Explored a World Happiness Report dataset containing data from 165 countries from 2005 to 2022 to identify trends in national happiness levels over time.
- Assessed missing data and engineered new features, including progress in happiness, for deeper analysis of country-level trends.
- Employed statistical analysis techniques such as correlation matrices and principal component analysis to determine key drivers of happiness across nations.
- Drew insights into how GDP, social support, corruption, and other factors relate to national happiness.
- Created an interactive dashboard in Tableau with which users can explore the dataset. Filters like region, country, and measure simplify comprehension of the multi-dimensional dataset.

**Marine Productivity Analysis**, UCSB, Santa Barbara

April 2023

- Analyzed relationships between chlorophyll, nitrogen, phosphorus, and location data within a National Coastal Condition Assessment dataset to assess nutrient levels and primary productivity in US coastal waters.
- Identified trends linking nutrient availability to increased chlorophyll and primary productivity across regions and seasons through statistical analysis.
- Examined seasonality of California coastal water productivity, noting increases in warmer months, and determined coastal regions with the highest occurrences of chlorophyll concentration anomalies.
- Created a dynamic dashboard in Tableau to help users visualize, understand, and investigate the dataset.

**Voter Turnout Predictors**, UCSB, Santa Barbara

February 2023

- In a team environment, analyzed US voter participation trends across over 40 million rows of data from national voter files using PySpark and Google Cloud Platform.
- Visualized relationships between demographics of interest and voter turnout using Matplotlib and Seaborn to highlight trends for data storytelling.
- Engineered new features such as age groups and home square footage bins to improve visualization clarity.
- Trained machine learning models, one with logistic regression and another with decision trees, to predict voter turnout based on features like age, income, and education level.
- Compared model performances, then used the model with greater accuracy to compare feature importances between historically Democratic and Republican states.
- Drew insights about how education level and other factors along with state political affiliation affect voter turnout.

## WORK EXPERIENCE

**Flex Associate**, Amazon Fresh, Porter Ranch, CA

November 2020 - February 2022

- Utilized order-processing software to complete and organize online orders.

**Private Tutor**, Porter Ranch, CA

September 2020 - May 2021

- Tutored multiple high school students taking AP Computer Science A by helping them with problems such as determining code output and writing more efficient programs.
- Outlined study patterns for students to ensure their comprehension of all course material, resulting in assignment and test grade improvements of up to 20%.

## SKILLS

- **Programming Languages:** Python, R, SQL, SAS, JavaScript, C++, Java
- **Tools:** pandas, scikit-learn, PySpark, Jupyter, Tableau, HTML, CSS, LaTeX, Google Cloud Platform