Zoe Ludena

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Education

University of California, San Diego *Mar 2025*

BS in Data Science, Minor in Business Economics

- **Coursework:** Interactive Visualizations, Probabilistic Modeling and Machine Learning, Dimensionality Reduction and Deep Learning, Business Analytics, Deep Model Climate Emulation

Experience

Student Worker *San Diego, CA*

San Diego Sheriff's Office *Feb 2024 – Present*

- Identify patterns and anomalies in large, continuously growing text datasets by leveraging text machine learning techniques, Regex, Python, Pandas, and SQL.
- Communicate findings effectively through presentations, driving informed decision-making and cross-team alignment.
- Streamline data processing by developing Azure-based pipelines to incrementally clean data, perform sentiment analysis, and vectorization.

Data Science Instructional Assistant *La Jolla, CA*

Halıcıoğlu Data Science Institute *Mar 2023 – Mar 2025*

- Enhance student performance and engagement by hosting office hours twice a week and creating 5+ educational videos and examples, leading to improved class comprehension and higher assignment scores.
- Improve assignment quality and exam rigor by developing midterm materials and grading assignments for 200+ students, ensuring alignment with learning objectives.
- Achieve consistent resolution of forum inquiries, answering 10+ questions weekly to clarify complex concepts in statistics, Python, Java, Pandas, and NumPy.

Projects

SeeRise: Visualizing Emulated Sea Level Rise on Coastal Regions *SeeRise Page* ↗

- Recreated Gaussian Process and CNN-LSTM emulators from ClimateBench by replicating model architectures and tuning hyperparameters, enabling analysis of sea level rise projections.
- Built the SeeRise website and interactive app by developing front-end features, visualizations, and explanatory content, improving public access to sea level rise predictions.

Utilizing Emulators to Explore the Climate Model Parameter Space *Repo* ↗

- Collaborated with Professor Duncan Watson-Parris and a team of two to recreate the Climate Bench Paper ↗ using machine learning models (Gaussian Process, Random Forest, Neural Networks) for future climate predictions.
- Leveraged Python and XArray for data analysis and modeling, ensuring accurate representation of climate dynamics.

Water Quality & Socioeconomic Status in CA *Jun 2024*

- Analyzed the relationship between water quality and socioeconomic factors (income, education, and race) across California using public datasets.
- Identified significant disparities affecting disadvantaged communities through statistical methods, including regression analysis, ANOVA, and Kruskal-Wallis tests.
- Utilized diverse data sources such as the U.S. Census and SAFER Dashboard, generating insights to inform equity-focused water management strategies.

Technologies

Languages: Python, Pyspark, LaTEX, SQL, Javascript, Java, HTML

Technologies: Git/Github, Windows OS, Microsoft SQL Server, Microsoft Office, VSCode, Tableau, PowerBI, Microsoft Azure

Honors: UCSD Provost Honors, IEEE - Eta Kappa Nu