Jeremy Doan

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Education

University of California, San Diego — San Diego, CA
Bachelors/Masters of Science in Structural Engineering, ***GPA: 3.6*** — *Sep. 2021 – June 2026*

Experience

Undergraduate Research Assistant — April 2024 – Present
UCSD Structural Engineering — *San Diego, CA*

- Under the supervision of Professor Shabnam Semnani (Assistant Professor, Structural Engineering).
- Developed Python scripts by implementing key machine learning libraries such as PyTorch, NumPy, and Scikit-learn to preprocess datasets and fine-tune hyperparameters, reducing training time by **20%.**
- Refined Generative Adversarial Networks (GANs) to replicate images of real-world rock microstructures from a dataset of over **1000** rock microstructure images.
- Enhanced model performance by experimenting with various architectures and loss functions, optimizing the convergence of the GAN, improving the quality and accuracy of generated images, and achieving a **75%** reduction in error.

Struc. Eng. Chair's Student Council Member — Aug. 2023 – Present
UCSD Structural Engineering — *San Diego, CA*

- Represented over **700** undergraduate students by actively serving as a liaison between the student body and departmental leadership, addressing academic concerns, and driving student-focused initiatives.
- Presented to visitors, prospective students, and current students, offering documentation and insights into the Structural Engineering program and student experience.
- Represented the department at university-wide events, including New Student Welcome Day, promoting the program and providing a deeper understanding of Structural Engineering and its opportunities.

Instructional Assistant — Sep. 2024 – Present
UCSD Structural Engineering — *San Diego, CA*

- Graded examinations and assignments for **150** students, providing timely feedback to promote academic growth.
- Proctored **3** examinations, ensuring a fair testing environment and adherence to academic integrity standards.
- Maintained and updated student records accurately within **3 days** of assignment, facilitating smooth administrative processes.

Projects

Conditional Generative Adversarial Network | *Python, Pytorch, NumPy, Matplotlib* — Aug. 2024 – Jan. 2025

- Implemented a conditional Generative Adversarial Network (cGAN) in **Python** to generate realistic images of rock microstructures using a training dataset of **1000** fieldstone and sandstone images that were processed in **ImageJ**.
- Implemented image classification based on material volume fraction for two-phase and five-phase rocks to be used as the cGAN condition using **Pytorch**, optimizing adversarial loss and visual accuracy of generated images.
- Reduced generator error by **75%** compared to an unconditioned GAN using the same dataset.
- Replicated image phase ratios/volume fractions with **94%** accuracy, improving by **19%** compared to a basic GAN.
- Visualized volume fraction histograms, loss plots, and fake/real image comparisons using **Matplotlib** and **NumPy**.

Matlab Buckling Analysis Game | *Matlab, HTML* — June 2024 – Aug. 2024

- Created an interactive **Matlab** game that challenges users to solve randomized cantilever buckling problems.
- Implemented game mechanics allowing users to earn in-game currency by making wagers and solving for a designated parameter.
- Implemented an endless gameplay mode after achieving the goal amount of 500 points which introduced randomized events that allowed players to gain or lose currency.
- Used **Matlab** and **HTML** to design GUI and format text.

Technical Skills

Programming: Machine learning, Python, Matlab, HTML
Graphical and Analysis Software: Abaqus, Solidworks, Revit, AutoCAD, ImageJ, Microsoft Excel
Soft Skills: Leadership, Public Speaking, Mentorship