Jacob Dugan

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EXPERIENCE

Research Assistant — Medical Imaging
Sep 2023–Apr 2024

Pepperdine University — *Malibu, CA / Remote*

- Built a 3D Variational Autoencoder in TensorFlow / Keras, expanding a 50-scan cerebral-angiogram set to 1,000 synthetic volumes for research scalability.
- Methodology contributed to *"3D Reconstruction from 2D Cerebral Angiograms as a Volumetric Denoising Problem"* (Springer LNCS, ISVC 2023).

Keck Scholars Fellow — Geospatial ML
May 2023–Aug 2023

Keck Data Science Institute — *Malibu, CA*

- Awarded $13.5 k Keck Data Science Grant (Level 1) to analyze nationwide stroke-care access.
- Engineered Python / Docker workflow (OpenStreetMap + openrouteservice) computing 84,000 tract-to-hospital travel times for 2,500 centers, 110 million lat-lon pairs; rendered results in an interactive Mapbox choropleth highlighting rural and low-income gaps.
- First-author presenter, abstract accepted at *International Stroke Conference 2024*.

PROJECTS

Boosting Student Outcome Prediction
Spring 2023

- Built an interpretable XGBoost pipeline on anonymized, 10-year data from 4,000+ undergrads; achieved 48% recall on second-year dropouts after one semester of data, 38 percentage points above vendor baseline (10%).
- Applied SHAP value analysis to identify key risk drivers (e.g., GPA drift, credit load, HS GPA, test scores) and verify demographic fairness.
- Delivered model artifacts, feature store schema, and executive summary to the Dean's Office and Student Success Center for production hand-off.

TECHNICAL SKILLS

Languages: Python (proficient) · SQL (basic) · Bash (basic)

Frameworks & Libraries: PyTorch · TensorFlow / Keras · Hugging Face Transformers · Scikit-learn · XGBoost

Gen-AI & LLM Ops: OpenAI API · LoRA / PEFT fine-tuning · Prompt engineering

Data & MLOps: NumPy · Pandas · Pydicom · OpenCV · Matplotlib / Plotly · Docker · Git · AWS (S3, EC2) · Google Colab · CUDA GPUs

Domain Strengths: 3D VAEs & generative CV · Reinforcement Learning (OpenAI Gym) · Geospatial analytics · Time-series modeling

EDUCATION

University of Edinburgh
Sep 2024–Sep 2025 (expected)

MSc, Artificial Intelligence — *Edinburgh, UK*

- Graduate focus: Accelerated NLP, NLU / NLG, Machine Learning Practical, Computer Vision, Advanced Database Systems; dissertation on LLM-based contract-risk quantification.

Pepperdine University
Aug 2019–Dec 2023

BA, Economics — Minor in Data Science, Magna Cum Laude, GPA 3.71 — *Malibu, CA*

- Selected coursework: Applied Data Science, Intro to Machine Learning, Econometrics, Statistics, Computational Image Analysis.

PUBLICATIONS & HONORS

Dugan J. *et al.* "Mapping Accessibility Differences of Acute Stroke Centers in the United States." *Stroke* — International Stroke Conference, Abstract #5200 (2024).

Keck Scholars Fellowship — Level 1 research grant, $13.5 k (2023).

Dean's List — Top 10% of class (2023).