Avi Mehta

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Education

University of California San Diego San Diego, CA
Bachelor of Science in Data Science, Minor in Mathematics *June 2026*

- Halıcıoğlu Data Science Institute Undergraduate Scholar
- **Coursework**: Deep Learning, Practice of Data Science, Probability, Mathematical Statistics, Data Management, Statistical Analysis, Theoretical Foundations of Data Science, Linear Algebra, Data Ethics, Data Visualization

Experience

Machine Learning Researcher Aug 2024 – Present
AIRE Labs at UC San Diego *San Diego, CA*

- Awarded **$2250** to Quantize PointNet model to be deployed on FGPA chips for particle physics experiments
- Conducted hyperparameter search for quantization, identifying optimal bit-widths to reduce model size by **50%**
- Redesigned the neural network architecture to address memory leakage and achieve a more compact model size

Artificial Intelligence Researcher May 2024 – Oct 2024
Department of Systems Engineering, CUHK *Sha Tin, Hong Kong, SAR*

- Embedded a watermark, an invisible pattern to detect machine-generated text, into the GPT-2 LLM during **fine-tuning** with **PyTorch**, **NLTK**, and **DeepSpeed**, modifying the token probabilities, ensuring all text generated by the model could be identified as machine-generated through watermark detection
- Performed **knowledge distillation** using the **MiniLLM** framework from the teacher model to the student model, reducing model size while maintaining performance as reflected by a **10.485 Rouge-L score**
- Conducted **hypothesis testing** and obtained a **p-value of 0.473**, failing to reject the null hypothesis that the watermark is not retained during the distillation process from the teacher model to the student model
- **Designed new algorithms** to preserve watermarks during distillation by implementing a joint optimization framework with regularization, contributing to advancements in **secure AI model deployment**

Data Analyst May 2023 – Sept 2023
Peconic Bay Medical Center *Riverhead, NY*

- Utilized **SQL** to extract, query, and analyze health data for **500+** patients, including BMI, exercise levels, joint pain, and breathing, enabling healthcare providers to make more informed, data-driven treatment decisions
- Developed a **predictive model** with **scikit-learn** to project health outcomes based on habits, leveraging features like BMI and heart rate, assisting **50+** patients in understanding and improving their health trajectories
- Collaborated with a three-member team, including regular communication with an occupational therapist, to ensure informed decision-making and steady project progress through cross-functional insights

Projects

CareDirect | *Node.js, Express, MongoDB, Python, TypeScript, AWS, and React Native* Oct 2024

- Won **$1000** for **"Most Innovative Project"** at Big Data Hackathon 2024 by developing CareDirect, a healthcare app offering real-time ER wait times and cost estimates.
- Implemented features to help users locate nearby, affordable care based on insurance, injury type, and hospital-specific costs to enhance accessibility and decision-making.

Power Outage Predictor | *Python, Scikit Learn* May 2024 – June 2024

- Preformed **exploratory data analysis (EDA)** on a dataset of **1,534** U.S. power outages, cleaning data by dropping columns and imputing missing values, and visualized outage distributions across climate regions
- Conducted a **permutation test** to evaluate the impact of climate regions on power outage duration, concluding no significant effect on outage times, with a **p-value of 0.453**
- Built and tested a **Random Forest** model to predict outage duration, using a custom function to test 6 feature combinations, tuning hyperparameters, and identifying the best model with an **RMSE of 1363.76**

Skills

Languages: Java, Python, SQL , JavaScript, HTML/CSS, R
Libraries: PyTorch, Tensorflow, Pandas, DeepSpeed, NLTK, NumPy, Matplotlib, Scikit-learn