Sumit Mantri

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Education

University of California, Davis - Computer Science and Statistics (Machine Learning Track)

WORK EXPERIENCE & ACTIVITIES

UC Davis Research - *Dr. Tagkopoulos Lab* *May 2025 -*

- Working under Phd. Student Pranav Gupta in implementing **classification models** for peptides through transformers, 1D Convolution, and other RNN layers for sequences of data
- Understood the **D3PM model** implementation and fine tuning of the model in creating synthetic sequences that can be tested in real world

Artificial Intelligence Student Collective - *SWE in Objected Detection* *October 2024 -*

- **Web-Scraping** to gather data for our test set via **Selenium** and chrome Web Driver
- Used **You Only Look Once (YOLO) model** through TensorFlow framework to provide live haptic feedback to the user
- Implementing customizable volume output based on proximity of the object that are in focus

Deep Learning.AI - *Student* *June 2024 - October 2024*

- Acquired in-depth knowledge of supervised learning techniques
- Developed and optimized neural network architectures, including **Convolutional Neural Networks** (CNNs), **Recurrent Neural Networks** (RNNs), LSTMs, and **Transformers Network**.
- Enhanced model performance using techniques such as Dropout, **Batch Normalization**, and Xavier/He initialization.
- Gained expertise in theoretical concepts and applied them to real-world problems in Python and **TensorFlow**, with practical experience in speech recognition, music synthesis, chatbots, machine translation, and **Natural Language Processing (NLP)**.

Cisco- *Programmer/Marketer (Job Shadow)* *June, 2022 - July, 2022*

- Expanded industry knowledge and **professional network** through engagement with Cisco employees, and gained valuable insights into the company's organizational structure
- Developed a **marketing strategy** during a hackathon, conducting surveys with Cisco employees on mental health to inform solution implementation
- Served as **programming lead** for the **hackathon** team alongside my colleague, developing a **personalized mental health Webex chatbot** named Carely to address user needs using **Javascript** and **Express**

PROJECTS

Image Segmentation *June 2024 - July 2024*

- Built a **U-Net convolutional neural network** in TensorFlow/Keras for **semantic image segmentation** on a self-driving car dataset.
- Preprocessed image and mask data using **tf.data pipelines** and custom augmentation functions to prepare inputs for training.
- Achieved **90% accuracy** by designing and testing modular **U-Net blocks (convolution, pooling, upsampling)** to ensure correct architecture using model summaries

Chronic Kidney Disease Detection *March 2025 - April 2025*

- Built machine learning models to classify Chronic Kidney Disease stages using patient lab data.
- Preprocessed features with imputation, scaling, and one-hot encoding through **scikit-learn pipelines**.
- Performed **detailed error analysis** by comparing training and validation performance to identify underfitting and overfitting. Then, based on the findings, I've adjusted model complexity and tuned hyperparameters using **GridSearchCV** and **RandomizedSearchCV** to improve generalization
- Boosted test accuracy from ~61% with logistic regression to ~75% with Random Forest, and lastly **~98% accuracy with XGBoost**, verified through **StratifiedKFold learning curves**.

TECHNICAL SKILLS

Languages: Python 3, C++, Java, R, MATLAB, HTML, CSS, Node.JS, Javascript, MongoDB
Frameworks: TensorFlow, Keras, NumPy, Pandas, Skikit Learn, React, Express
Developer Tools: Visual Studio Code, R Studio, Jupyter, Git, GitHub, Compass