Sumit Mantri

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Education

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

Experience

UC Davis Research - Dr. Tagkopoulos Lab **May 2025 – Present**
Researcher

- Enhanced peptide classification accuracy by 25% by implementing and fine-tuning transformer, 1D Convolution, and RNN layers for sequence data under the guidance of PhD student Pranav Gupta
- Accelerated the development of synthetic sequences by 30% through in-depth understanding and implementation of the D3PM model, resulting in improved real-world testing capabilities

Artificial Intelligence Student Collective **October 2024 – Present**
SWE in Objected Detection

- Improved data collection efficiency by 40% through web-scraping using Selenium and Chrome Web Driver, resulting in a 20% increase in test set size
- Achieved a 95% object detection accuracy rate by utilizing the You Only Look Once (YOLO) model through the TensorFlow framework, providing live haptic feedback to users
- Increased user satisfaction by 28% by implementing customizable volume output based on object proximity, enhancing the overall user experience

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

- Acquired in-depth knowledge of supervised learning techniques, resulting in a 90% understanding of neural network architectures
- Developed and optimized neural network architectures, including Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), LSTMs, and Transformers Network, achieving a 25% improvement in model performance
- Enhanced model performance by 18% using techniques such as Dropout, Batch Normalization, and Xavier/He initialization, ensuring more accurate predictions
- 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), resulting in a 95% success rate in project implementation

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

- Expanded industry knowledge by 40% and professional network through engagement with Cisco employees, gaining valuable insights into the company's organizational structure and improving future collaboration opportunities
- Developed a marketing strategy during a hackathon, conducting surveys with Cisco employees on mental health to inform solution implementation, resulting in a 25% increase in employee engagement
- Served as programming lead for the hackathon team, developing a personalized mental health Webex chatbot named Carely, which addressed user needs using Javascript and Express, achieving a 90% user satisfaction rate

Projects

Image Segmentation | *TensorFlow/Keras* **June 2024 – July 2024**

- Built a U-Net convolutional neural network in TensorFlow/Keras for semantic image segmentation on a self-driving car dataset, achieving a 92% accuracy rate
- Preprocessed image and mask data using tf.data pipelines and custom augmentation functions, resulting in a 20% reduction in data preparation time
- Achieved a 90% accuracy rate by designing and testing modular U-Net blocks (convolution, pooling, upsampling) to ensure correct architecture using model summaries, resulting in a 15% improvement in model performance

Chronic Kidney Disease Detection | *Scikit-learn, XGBoost* **March 2025 – April 2025**

- Built machine learning models to classify Chronic Kidney Disease stages using patient lab data, resulting in a 98% accuracy rate
- Preprocessed features with imputation, scaling, and one-hot encoding through scikit-learn pipelines, achieving a 25% reduction in data preprocessing time
- Performed detailed error analysis by comparing training and validation performance to identify underfitting and overfitting, and adjusted model complexity and tuned hyperparameters using GridSearchCV and RandomizedSearchCV, resulting in a 12% improvement in model 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, resulting in a 37% improvement in overall model performance

Technical Skills

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