PREETHAM GANESH

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EDUCATION

University of Texas at Arlington — Arlington, TX
Master of Science in Computer Science — Aug 2019 - May 2021
Coursework: Computer Vision, Special Topics in Intelligent Systems, Machine Learning, Neural Networks, Data Mining.

Amrita Vishwa Vidyapeetham — Coimbatore, India
Bachelor of Technology in Computer Science and Engineering — Jul 2015 - Apr 2019

SKILLS

Machine Learning	Decision Tree, KNN, SVM, K-Means, Random Forest, XGBoost, Bagging, LSTM, GRU, CNN
Programming	Python, C, C++, R, Java
Libraries	TensorFlow, Keras, Scikit-Learn, NumPy, SciPy, OpenCV, Pandas, Pickle, Matplotlib, Flask, Tableau
Database	Oracle SQL, SQLite, MySQL
Operating Systems	Mac OS, Ubuntu, Windows

PROJECTS

Translation of Continuous American Sign Language to English Language Speech (Master's Thesis) — Jun 2020 – Present
- Developing an American Sign Language Translation application (using Python) for converting sentence-based signs performed by signers to English language speech under the guidance of Prof. Vassilis Athitsos.
- Consists of 3 modules: Continuous Sign Language Recognition, ASL Translation, and English Speech Synthesis, where each module uses **Seq2Seq with attention mechanism** for training, and Top-K Accuracy, BLEU, and Mean Opinion Score for evaluating the models.
- The current Continuous Sign Language Recognition model (Pose-based) produced a Top-5 accuracy of 55.45% on the WLASL dataset.

Image Captioning using Luong Attention and SentencePiece Tokenizer — Nov 2020 – Dec 2020
- Developed an Image Captioning application (using Python) for predicting captions for an image given by the user.
- Used **SentencePiece** tokenizer to tokenize the target captions and used **InceptionV3** network to extract features in the image. Implemented **Luong Attention-based Stacked Unidirectional Long-Short-Term-Memory (LSTM)** for predicting the captions. Also built a UI for interacting with the application (using Flask).
- The model produced a Sparse Categorical CrossEntropy Loss of 0.628 on the MS-COCO dataset.

POS-Tagging based Neural Machine Translation for European Languages using Attention Mechanism — Jun 2020 – Dec 2020
- Developed a Neural Machine Translation application (using Python) for European Languages such as Spanish, French, and German.
- Used **Luong-Attention based Bidirectional Stacked Long-Short-Term-Memory (LSTM)** Seq2Seq model, along with **Transformer** based translation model for training models in each language. Also built a UI for interacting with the application (using Flask).
- The English-Spanish Transformer model produced a BLEU score of 30.27 and METEOR score of 56.425 on the newstest2013 dataset.

COVID-19 Social Distancing Violation Detection using Neural Networks — Sep 2020
- Developed an application (using Python) for detecting the social distancing violation in a given area or a user-given video.
- **Yolov3 Object Detection** model was used for detecting people in a video, & the distance between detected bounding boxes was calculated using the **SciPy Spatial Distance** function. If the distance between 2 bounding boxes is less than 6 ft, then an alert is generated.

COVID-19 Face Mask Detection using Neural Networks — Aug 2020
- Implemented a face-detection module using the ImageNet weights for detecting faces in a video.
- The detected faces were converted into 128-byte Encoding for identifying unique set of faces. Also, implemented a face mask classifier that produced using a **Convolutional Neural Network** for classifying whether the people in the detected set of unique faces wore a face mask. If no mask is detected, then an alert is generated. The model produced an accuracy of 86%.

Forecast of Rainfall Quantity and its Variation using Environmental Features (Undergraduate Thesis) — Jun 2018 – Apr 2019
- Developed an application for predicting rainfall in Tamil Nadu districts, India using regression and ensemble algorithms to find the best model among the District-Specific, Cluster-based, & Generic-Regression models under the guidance of Asst. Prof. Dayanand Vinod.
- The regression algorithms used are **Multi-Linear, Support Vector, Decision Tree, Polynomial**, **Random Forest, Bagging,** & **XGBoost**, which was combined using ensemble techniques such as **Simple Averaging, Stacking** & **Blending.**
- The final model produced a Mean Squared Error value of 0.000274 and Explained Variance Score of 0.9113.

PUBLICATIONS, ACHIEVEMENTS & LEADERSHIP

Personalized system for human gym activity recognition using an RGB camera: PETRA (first author, DOI, PDF, GitHub) — Mar 2020
Estimation of Rainfall Quantity using Hybrid Ensemble Regression: ICACC (first author, DOI, PDF, GitHub) — Aug 2019
Forecast of Rainfall Quantity and its Variation using Environmental Features: IPACT (first author, DOI, PDF, GitHub) — Feb 2019
Juxtaposition on Classifiers in Modeling Hepatitis Diagnosis Data: ICCVBIC (first author, DOI, PDF, GitHub) — Nov 2018
Recipient of the **Outstanding Student Award** by Department of CSE, Amrita Vishwa Vidyapeetham. — Apr 2019
Chairman of ASCII Technical Club, Department of CSE, Amrita Vishwa Vidyapeetham. — Jun 2018 – Apr 2019