

# Preetham Ganesh

📍 Arlington, Texas, United States ✉ Preetham.ganesh2021@gmail.com ☎ (682)812-9865 📧 in/preethamganesh/ 🌐 bit.ly/preetham\_website

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## EDUCATION

**Master of Science in Computer Science | University of Texas at Arlington | Arlington, TX |**  
**May 2021 | Selected Coursework: Computer Vision, Machine Learning, Neural Networks, Data Mining**

**Bachelor of Technology in Computer Science | Amrita Vishwa Vidyapeetham | Coimbatore, India |**  
**April 2019 | Selected Coursework: Intelligent Systems, Natural Language Processing | Outstanding Student Award 2019**

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## EXPERIENCE

**Graduate Student Researcher | UTA Vision-Learning-Mining Research Lab | Arlington, TX | February 2020 - Present**

- Developing an application to recognize Continuous American Sign Language using Convolutional Recurrent Neural Network & 3D CNN.
- Used VGG-16 & OpenPose to extract features from the videos and GRU to predicts the sequence of words with the help of Softmax layer.
- The current version of the application achieved a Top-5 Accuracy of 55.45% on the test WLASL dataset.

**Undergraduate Student Researcher | Amrita Machine Learning Lab | Coimbatore, India | June 2018 - July 2019**

- Developed an application to predict rainfall in Indian districts using district-wise location based analysis to increase the EVS by 10%.
- District and State rainfall data modeled using regression algorithms such as Decision Tree, Polynomial, Random Forest, & XGBoost, and combined results using ensemble techniques such as Stacking. The final hybrid ensemble regression model achieved an EVS of 0.911.
- Links: [bit.ly/rainfall\\_1\\_publication](https://bit.ly/rainfall_1_publication), [bit.ly/rainfall\\_1\\_git](https://bit.ly/rainfall_1_git), [bit.ly/rainfall\\_2\\_publication](https://bit.ly/rainfall_2_publication), [bit.ly/rainfall\\_2\\_git](https://bit.ly/rainfall_2_git).

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## SKILLS

**Proficient: Python, C, SQL | TensorFlow, Keras, Scikit-Learn, NumPy, Pandas, Pickle, Matplotlib | Git, GitHub | Latex**

**Intermediate: C++, Java | Pytorch, Caffe, SciPy, OpenCV, Flask, Multiprocessing | Docker**

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## PROJECTS

**POS-Tagging based Neural Machine Translation using Attention Mechanism | University of Texas at Arlington | January 2021**

- Developed an application for translating text entered by the user from a European language (Spanish/French/German) to & from English.
- Used Multiprocessing package for faster preprocessing of the dataset, Luong Attention-based Bidirectional Stacked LSTM Seq2Seq model & Transformer model algorithms for building the neural network model.
- The English-Spanish Transformer model achieved a BLEU score of 30.27 and METEOR score of 56.425 on the newstest2013 dataset.
- Tech Stack used: TensorFlow, Keras, Flask, Multi-processing, Scikit-Learn, Pickle. (GitHub: [bit.ly/lang\\_trans\\_github](https://bit.ly/lang_trans_github)).

**Captioning of Images using Luong Attention | UTA Human Data Interaction Lab | November 2020**

- Architected a TensorFlow-based application for predicting captions of an image given by the user.
- Used SentencePiece tokenizer to tokenize the target captions, InceptionV3 network to extract features from the image, Luong Attention for extracting nuances from the target captions, LSTM for predicting the sequence of words. Reduced the model's loss to 0.628 on the test set.
- Tech Stack used: TensorFlow, OpenCV, NumPy, Scikit-Learn, Pandas, Keras, Flask. (Links: [bit.ly/caption\\_git](https://bit.ly/caption_git), [bit.ly/caption\\_medium](https://bit.ly/caption_medium)).

**COVID-19 Social Distancing Violation Detection using Neural Networks | University of Texas at Arlington | September 2020**

- Built an application for detecting the social distancing violation in a given area or a user-given video.
- Used YoloV3 Object Detection Neural Network for detecting people in a frame, & used SciPy Spatial Distance function for calculating the real-world distance between 2 bounding boxes and generated alert when distance < 6 ft.
- Tech Stack Used: TensorFlow, OpenCV, SciPy, NumPy.

**COVID-19 Face Mask Detection using Neural Networks | University of Texas at Arlington | August 2020**

- Architected a face-detection module using the ImageNet weights for detecting faces in a video.
- Converted detected faces into 128-byte Encoding, used face\_encoding to compare faces and extract distinctive faces.
- Developed a face mask classifier using Convolutional Neural Network. The model produced an accuracy of 0.86.
- Tech Stack Used: Face\_Recognition, OpenCV, NumPy. (Links: [bit.ly/covid\\_face\\_git](https://bit.ly/covid_face_git)).

**Personalized System for Human Gym Activity Recognition using an RGB Camera | UTA Heracleia Human-Centered Computing Lab. | February 2020**

- Developed a personalized system capable of recognizing a list of gym activities & providing feedback on the correctness of the joint movement in the workout along with the number of repetitions performed by the user with the help of android application.
- Recorded videos to create dataset, used OpenPose to extract pose-information, and used Random Forest to classify the gym activities.
- Implemented repetition counter module and correctness of workout module using Local Minima analysis & Dynamic Time Warping. The Random Forest model attained an accuracy of 98.98% on the test set.
- Tech Stack Used: Scikit-Learn, Caffe, OpenCV, NumPy, Django, Flask. (Links: [bit.ly/gym\\_git](https://bit.ly/gym_git), [bit.ly/gym\\_publication](https://bit.ly/gym_publication)).