Sudarshana Lakshmi Krishna

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Education

North Carolina State University, Raleigh   *August 2019 - May 2021*

Master of Science in Electrical Engineering, GPA: 3.667

Courses: Digital Imaging Systems, Digital Signal Processing, Random Processes, Computer vision, Neural Networks, Artificial Intelligence, Data Science, deeplearning.ai(Coursera), Data Science(Coursera- from John Hopkins University), Machine Learning(Coursera- from Stanford), NLP(Coursera)

Skills

Programming Languages	Python, C/C++, LaTeX, MATLAB
Softwares	Arduino Software(IDE), MATLAB App Designer, VSCode, Microsoft Office, Jupyter notebook
Libraries & Toolboxes	MATLAB Image and Signal Processing ToolBox, numpy, scipy, openCV, scikit-learn, pandas
Deep Learning Platforms	Tensorflow, Keras
OS	Windows, Linux

Experience

Youtopian, New Jersey, USA - Remote   *Present*

AI XR INNOVATION INTERN

- Volunteering position;Create education sector chatbots using Amazon Lex and AWS Sumerian platform.
- Experience in restructuring and understanding inbuilt Javascript codes.
- Team player in the startup; Gathering market research; Innovating ideas that create value by integrating recent technology and people's needs.
- Actively contribute in weekly sprints and deliver results

Active Robotics Sensing(AroS) Lab, North Carolina State University   *Present - Ongoing*

STUDENT VOLUNTEER - RESEARCH

- Working under Prof. Dr. Edgar Lobaton, North Carolina State University on Thesis topic - "Visual Segmentation of Crop Damage due to storms".
- Stitching UAV Drone imagery to create orthomosaics using Solvi and Pix4D softwares.
- Researching papers on possible deep learning models (likely, Detectron2)to enable visual segmentation.

Image Processing and Computer Vision(IPCV) Lab, Indian Institute of Technology, Madras(IITM), India   *May 2018 - July 2018*

SUMMER INTERN - DOMAIN: IMAGE PROCESSING - IMAGE SEGMENTATION

- Developed a solution to **Dirt Detection on Camera Lens** under Prof. Dr. A.N.Rajagopalan.
- Devised an algorithm using MATLAB to detect regions of dirt on camera lens from captured images.
- Executed above solution through a combination of spatial gradient, spatial variance, temporal intensity differences and superpixel segmentation.
- Accomplished detection of solid dirt and water droplets.

Projects

Hyperparameter Tuning: Study of Babysitting Process for a Deep Learning model

DOMAIN: COMPUTER VISION- CLASSIFICATION MODEL OPTIMIZATION

- Analysed model performance for both Multi Layer Perceptron(MLP) and Convolutional Neural Network(CNN) model by testing with CIFAR10 dataset on Keras.
- Studied changes in model behaviour by varying different hyperparameters - optimizer, decay rate, momentum, learning rate scheduler, filter size, dropout values.
- Procured a final testing accuracy of 88% on CNN model.

Spam and Ham classification

DOMAIN: NATURAL LANGUAGE PROCESSING (NLP)

- Utilized 'SMS Spam Collection Data Set' from UC Irvine's Machine Learning Repository to create a 'Spam Filter'.
- Implemented a Naive Bayes' Classifier for classification between Ham and Spam messages.
- Coded a model on Google Colab using Python 3.6 by calling functions for Naive Bayes' classifier from scikit-learn.
- Achieved a precision of 94%.

Classification of Mosquito Species based on Wing structure

DOMAIN: COMPUTER VISION- IMAGE CLASSIFICATION

- Contributed in a team project aiming to distinguish between Restuans and Pipiens species of Culex mosquito variety.
- Implemented a transfer learning model of VGG19 trained on ImageNet to classify mosquito species based on wing structure as trial.
- Above procedure performed poorly on data set giving a validation accuracy of 49% and testing accuracy of only 25%.
- Built a final CNN model mimicking a few layers from VGG leading to an accuracy of 68%.

Identification of Leaf Wilting stages in Plants

DOMAIN: COMPUTER VISION- IMAGE CLASSIFICATION

- Project involves classification of plant images into 5 different stages based on leaf wilting levels.
- Shared ideas in an inter-cultural team of 3 members from different countries.
- Pre-processed data set containing crop images with five leaf wilting stages for a Convolutional Neural Network(CNN) model.
- Took initiative in preparing data set and applying data augmentation techniques using openCV in Python 3.6.
- Performed flip, crop, gaussian blur, image pixel enhancement methods to increase data set variability and size.
- Model created,gave an overall accuracy of 47%.