Tejoram Vivekanandan

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Education

Coimbatore Institute of Technology 2016 - 2020
Bachelor of Engineering in Electronics and Communication Engineering Overall CGPA: 8.66/10.00

- RELEVANT COURSEWORK: Robotics, Digital Image Processing, Data Structures & Algorithms, Probability & Random Process, Computer Organization & Microprocessor, Microcontroller Based System Design, C Programming, Programming in JAVA

Experience

Computational Imaging Lab – Indian Institute of Technology, Madras Chennai, India
Research Assistant September 2021 – Present

- Research Topic: "Restoring extreme dark night-time images and Stereo depth estimation in real-time for Autonomous Vehicles"
- Developed a neural model with inspirations from U-Net which enhances images of low light and also predicts depth.
- The architecture is 100x faster and 20x computationally cheaper than that of state of art low light restoration.

NASA – Jet Propulsion Laboratory Pasadena, California
Research Intern September 2020 – September 2021

- Research Topic: "Correlation between color changes in Jupiter's storm "Oval BA", cloud heights and ultraviolet exposure"
- Implemented an algorithm for image processing pipeline automation which processed data of more than two decades.
- Used Nodding technique to suppress the background emission of the Jupiter sky.
- Obtained groundbreaking results with a correlation of 92.44% applying Minnaert function which validates that Oval BA storm's color changes are due to cloud heights.

NRSC – Indian Space Research Organisation Hyderabad, India
Research Intern November 2019 – August 2020

- Research Topic: "Shadow Detection and Radiometric Restoration in VHR Satellite Imagery"
- Detected shadows of Cartosat -2E satellite images using Color Invariant Index and Variance.
- Restored shadows through Gamma correction, Linear Correction, and Histogram Matching.
- Implemented region-based image segmentation and achieved average restoration accuracy of 96%.

Ministry of Electronics and Information Technology Chennai, India
Research Intern May 2019 – June 2019

- Research Topic: "Accelerated Life Testing"
- Designed algorithms by the application of Arrhenius, Eyring and Inverse Power Law relations, to extrapolate end-use reliability characteristics of electronic products.

Publications

- Tejoram V et al., "Shadow Detection and Radiometric Restoration in VHR Satellite Imagery", *Journal of the Indian Society of Remote Sensing*, 2020 [Under Review]
- Tejoram V et al., "Autonomous Vehicle Using Artificial Intelligence", *Proc. Springer Int. Conference - Smart Materials and Techniques for Sustainable Development*, 2019
- Tejoram V, "Advanced Space Vehicle and Defense Robot", *Proc. IEEE Int. Conference - Electrical, Communication, Electronics, Instrumentation and Computing*, 2019

Academic Projects

Handwritten Digit Recognition 2021

- Removed background through edge detection, localization and perspective transform.
- Computed ROI bounding box after thresholding.
- Developed a deep neural network to recognize the digits through classification with 98% accuracy.

Fruits classification using Deep Learning 2020

- Developed a custom CNN to classify different kinds of fruits and to facilitate real-time automated billing in grocery shops.
- Done a similar project of classification of bird species for the Ministry of Environment, India.

Autonomous vehicle using Artificial Intelligence 2019

- Designed an autonomous robot to perform lane detection and route traversal using image processing and CNN.
- Equipped it with a Raspberry Pi for processing, a camera, and four ultrasonic sensors for perception.
- Attained 95% decision accuracy using softmax activation function with 256 hidden layer nodes.

Advanced space and defense vehicle 2018

- Devised a robot for defense applications without any communication range restrictions by DTMF technology.
- Equipped it with video streaming, data logging and the ability to handle signal jammers.

Path follower industrial robot 2017

- Designed a robot with an array of Infrared sensors for a predefined route in industries of automated manufacturing.
- Minimized the Interference caused by the IR band of sunlight.

Skills

- **Programming:** C++, Python, Java, MATLAB
- **Deep Learning frameworks:** Keras, Tensorflow, Pytorch

Awards & Honors

2nd Prize in Project Expo on Road safety April 2019
Robert Bosch

- Topic: "Autonomous vehicle using Artificial Intelligence"

3rd Prize in Paper Presentation March 2019
Government College of Technology

- Topic: "Bird Species Classification using Machine Learning"

1st Prize in South Zone Innovators Meet April 2018
Institution of Electronics and Telecommunication Engineers (IETE)

- Topic: "Advanced vehicle and Defense Drone"

3rd Prize in Project Presentation February 2018
Coimbatore Institute of Technology

- Topic: "DTMF Controlled and Line Follower Robot"

2nd Prize in Project Presentation February 2018
Thiagaraja College of Engineering

- Topic: "Advanced space and defense vehicle"