# TEJORAM VIVEKANANDAN

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## Education

**B.E. Electronics and Communication Engineering**, Coimbatore Institute of Technology, 2020
- CGPA - 8.66/10 (First class with distinction)
- 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 Vehicle"
- 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 the end-use reliability characteristics of the products.

## Publications

- Tejoram V et al., "Shadow Detection and 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.

**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**
Robert Bosch April 2019
- Topic: "Autonomous vehicle using Artificial Intelligence"

**3rd Prize in Paper Presentation**
Government College of Technology March 2019
- Topic: "Bird Species Classification using Machine Learning"

**1st Prize in South Zone Innovators Meet**
Institution of Electronics and Telecommunication Engineers (IETE) April 2018
- Topic: "Advanced vehicle and Defense Drone"

**3rd Prize in Project Presentation**
Coimbatore Institute of Technology February 2018
- Topic: "DTMF Controlled and Line Follower Robot"

**2nd Prize in Project Presentation**
Thiagaraja College of Engineering February 2018
- Topic: "Advanced space and defense vehicle"