



Harsh Raj

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In Electrical Engineering
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EDUCATION

Degree	Institute/Board	CGPA/Percentage	Year
M.Tech.	Indian Institute of Technology, Ropar	8.45	2020 - 2022
B.E.	University Institute of Technology, Burdwan	79.4 %	2015 - 2019
Senior Secondary	Bihar School Examination Board (B.S.E.B.)	65.8%	2014
Secondary	Bihar School Examination Board (B.S.E.B.)	80.4%	2012

INTERNSHIP / TRAINING

Vocational Training in Advanced Telecom

10 Jul. 2017 - 4 Aug. 2017

CTTC, BSNL/ Kolkata

- Overview of Telecom Network, Switching, Signaling and Routing, IN/ISDNA
- TCP/IP, OFC, GSM, SDH, CDMA, DWDM, GPRS+3G
- Battery and Power Plant Lab, C-DOT Lab, Broad Band and NIB Lab, OFC Lab, SDH and GSM Lab

PROJECTS

• Super Resolution Using Deep Learning

June 2021 - Ongoing

Under the guidance of Prof. J. S. Sahambi

Kaggle

- Objective: Improve single image resolution up to x8 resolution for broadcasting on wireless IoT devices, Remote Sensing and surveillance.
- With the help of Deep Learning models, upsampling the low-resolution image and comparing it with the other existing interpolation methods
- Tools - Kaggle, Tensorflow, GPU (CUDA)
- Deep Learning Models - ResNet (Residual Network) and Auto-Encoder

• IoT Based Smart Farming

June 2018 - June 2019

The University of Burdwan (B. E.)

- We developed a capacitive moisture sensor circuit whose output is fed to the Arduino-UNO board
- Arduino-UNO board sends the data to a web server, Blynk (an IoT platform) with the help of a Wi-Fi module (Node MCU, ESP8266)
- Users get the moisture content through the app provided by Blynk and can accordingly control the water supply to the crop

COURSE PROJECT

Transmit Signal Over Various Modulation Scheme Using Diversity Techniques

Jan 2021 - June 2021

Communication and Signal Processing Lab under the guidance of Dr Sam Darshi

Blogspot

- Using BFSK, BPSK, QPSK, and OFDM modulation scheme transmit random signal added with AWGN and Rayleigh channel using different combination techniques at the receiver. To calculate BER, Outage Probability and Throughput
- Tool used - MATLAB

Face Detection Using CNN (Convolution Neural Network)

Mar 2021 - Apr 2021

Digital Image Processing under the guidance of Dr Subrahmanyam Murala

Github

- In this project I worked with CNN (Convolution Neural Network) to detect & recognise faces using an inbuilt web camera
- Used Model - VGG 16 neural network architecture
- Tools - OpenCV, Tensorflow, Python3.6 Environment

Probabilistic Approach For Detect Image on Real Time Video

Mar 2021 - June 2021

Estimation and Detection Theory under the guidance of Dr Satyam Kumar

Github

- It is a probabilistic approach to detect a specific image on a video frame using the webcam on real time
- I used Bayesian Detection Theory to detect the image with the help of prior probability of the image
- Tools - OpenCV, Python3.6 Environment

TECHNICAL SKILLS

- **Programming Languages:** C/C++, Python
- **Software Libraries:** TensorFlow, Keras, Skimage, OpenCV
- **Other Skills:** MATLAB, 5G-NR, LTE, WLAN, Image Processing, L^AT_EX, Google Collaboratory, Kaggle, Github

KEY COURSES TAKEN

- **Communication & Signal Processing :**

ADC (Advanced Digital Communication)	ADSP (Advanced Digital Signal Processing)
DIP (Digital Signal Processing)	Detection and Estimation Theory
Mathematics related to communication systems	IoT (Internet of Things)

- **Python:** TensorFlow 2.0. (from Udemy)

EXTRACURRICULAR ACTIVITIES

- Presented Poster Presentation on Super-Resolution Using Deep Learning in EE-RSF (Research Scholar's Forum) at IIT Ropar