

Apoorva Kumar

ROBOTICS ENGINEER · MACHINE LEARNING ENTHUSIAST

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Education

Indian Institute of Technology, Guwahati

BACHELOR OF TECHNOLOGY

- Major in Electronics and Electrical Engineering, CGPA : 8.11/10
- Minor in Computer Science and Engineering, CGPA : 8.5/10

Guwahati, India

2016 - Ongoing

St. Michaels High School

XIITH FROM CBSE

- Grade : 95.2%

Patna, India

2013 - 2015

Don Bosco Academy, Patna

XTH FROM ICSE

- Grade : 94.2%

Patna, India

2002 - 2013

Skills

Robotics

ROS, OpenCV, Stereo Vision, Visual Odometry

Programming

Python, C++/C, Java, Unity3D

Hardware

Arduino, Raspberry-Pi, IMU Sensor, Camera, RGBD Camera, Motors And Encoders

Machine Learning

Decision Trees, SVM, Neural Networks, CNNs, GANs, RNNs

Operating Systems

Windows, Linux

Miscellaneous

Photography, Android App Development, Web-Request Handling

Work Experience

Strato IT, Protec Inc.

ROBOTICS & DEEP LEARNING INTERN

- Worked on building a visual odometer for automated cart.
- Implemented Deep Learning models like iResNet and PSMNet in Keras and Pytorch for disparity estimation of systems. Tested on various benchmark data-sets to develop a odometer for indoor localization.
- Developed an easy-to-use python modules for further extending the research and project.

Anyang, S.Korea

May 2019 - Jul. 2019

AppSecure

API DEVELOPER & MACHINE LEARNING INTERN

- Implemented a combined software for active sub-domain and port scanning for web-servers.
- Implemented a distributed web stress test tool with high anonymity.
- Using the above mentioned scanner on websites, trained a model to predict the presence of a word in the web-server directory or sub-domain.

Bengaluru, India

May. 2018 - Jul. 2018

Projects

Soil Estimation Robot

7TH INTER IIT TECHMEET | 5 MEMBER TEAM | 📄 GITHUB

- Project Aimed at easing the task of farmers while solving the problem of over-fertilization
- This model collects soil sample and using its solution and techniques of Colorimetry via a simple LDR and RGB-LED measures Nitrogen-Phosphorus-Potassium content in soil across farm lands.
- Presented to Tata Centre for Technological Development and won the bronze medal among 23 different participating IITs

IIT Guwahati, Guwahati, India

Nov. 2018 - Dec. 2018

Eye In The Sky

7TH INTER IIT TECHMEET | 3 MEMBER TEAM | 📄 GITHUB

- This project was about Remote sensing and we achieved it using semantic segmentation algorithms.
- We implemented 4 different algorithms UNet,PSPNet both with RGB Channels and One-Hot encoded channels.
- We were provided with training data for the problem statement consisting of 13 images containing 4 channel with 8 classes.

IIT Guwahati, Guwahati, India

Nov. 2018 - Dec. 2018

ARLE(Automated Robot for Library Enhancement)

IIT Guwahati, Guwahati, India

4I LABS, IIT GUWAHATI | 9 MEMBER TEAM | [GITHUB](#) | [HOME PAGE](#) | [YOUTUBE](#)

Jul. 2017 - PRESENT

- This was a project undertaken to add to the already in-action automation of Library of IIT Guwahati
- Our aim is to build a robot which can pick and place misplaced books in the library into their correct shelves.
- Built a Four Wheeled Robot which can perform SLAM in library environment.

Sub-Domains and Open-Port Scanner

Bengaluru, India

APPSECURE | SOLO PROJECT

May. 2018 - Jul. 2018

- In this project first of all I built a module to a combined software for active sub-domain and port scanning for web-servers.
- Later using Machine Learning techniques and the above mentioned scanner on websites, trained a model to predict the presence of a word in the web-server directory or sub-domain.
- Part of my internship at AppSecure during Summer 2018

Technologies for Soldier Support- Health Monitoring System

IIT Guwahati, Guwahati, India

6TH INTER IIT TECHMEET | 3 MEMBER TEAM

Dec. 2017 - Jan. 2018

- This project was built using MEMS Sensors namely MPU9250, Temperature Sensor and Heart Rate sensor to predict the physical state of ability and inability of a soldier during any battle.
- Build with a ESP8266 it transmitted data of the soliders condition to base station.

Courses

Electrical and Electronics

- Signals & Systems, Networks
- Control Systems
- State Space Models
- Discrete Time Control Systems
- Power Systems
- Electrical Machines
- Power Systems
- Semi-Conductor Devices
- Digital Systems
- Microprocessors
- Principles of Communication

Computer Science

- Game Theory
- Introduction to Computing
- Formal Automata
- Computer Architecture
- Embedded Systems
- Data Structures
- Algorithms
- Operating Systems
- Networks

Robotics

- ROS Tutorials in Python
- A.I. for Robotics
- Deep Learning for Self-Driving Cars

Mathematics

- Linear Algebra
- Real Analysis
- Vector Calculus
- Basic Calculus
- Discrete Maths
- Probability and Random Processes

Machine Learning and Deep Learning

- Basic Machine Learning
- Patter Recognition and Machine Learning
- Clustering Techniques
- Generative Adversarial Networks
- Optimization Techniques
- Structuring Machine Learning Projects
- Convolutional Neural Networks
- Natural Language Processing

Awards

2018 **Bronze Medal**, TCTD, 7th Inter IIT TechMeet, IIT Madras

Bombay, India

2018 **Bronze Medal**, Technologies for Soldier Support, 6th Inter IIT TechMeet, IIT Madras

Madras, India

2018 **1st Position for 2 consecutive years**, Electrovote, Inter-Hostel Tech-Innovation Event, IIT Guwahati

Guwahati, India

Positions of Responsibility

Apr. 2018 - Apr. 2019 **Secretary**, Robotics Club, IIT Guwahati

Guwahati, India

Feb. 2018 - Apr. 2019 **Co-Founder and Manager**, IITG.ai, IIT Guwahati

Guwahati, India

Apr. 2017 - Apr. 2018 **Technical Secretary**, Umiam Hostel, Hostel Affairs Board, IIT Guwahati

Guwahati, India

Apr. 2017 - Ongoing **Team Head**, ARLE, 4i Labs, IIT Guwahati

Guwahati, India