Apoorva **Kumar**

Robotics Engineer · Machine Learning Enthusiast

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Education

IIT Guwahati, B.Tech Major in Electronics and Electrical Engineering	CGPA : 8.11/10	2016 - Ongoing	*Guwahati, India*
IIT Guwahati, B.Tech Minor in Computer Sciences and Engineering	CGPA : 8.5/10	2017 - Ongoing	*Guwahati, India*
St. Michaels High School,Patna, Senior Secondary from CBSE	Grade : 95.2%	2013 - 2015	*Patna, India*
Don Bosco Academy, Patna, Secondary from ICSE	Grade : 94.2%	2002 - 2013	*Patna, India*

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.
Anyang, S.Korea

Robotics & Deep Learning Intern
May 2019 - Jul. 2019

- Worked on building a visual and inertial 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.

AppSecure
Bengaluru, India

API Developer & Machine Learning Intern
May. 2018 - Jul. 2018

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

Key Courses

Electrical and Electronics
- Control Systems
- Discrete Time Control Systems
- Signals & Systems, Networks
- Probability and Random Processes
- Digital Systems
- Microprocessors

Computer Science
- Game Theory
- Operating Systems
- Computer Architecture
- Data Structures
- Algorithms
- Networks

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

Mathematics
- Linear Algebra
- Basic Calculus
- Discrete Maths

Machine Learning and Deep Learning
- Basic Machine Learning
- Artifical Neural Networks
- SVMs, Decision Trees and Random Forest
- CNN and Computer Vision

Awards

2018	**Bronze Medal,** TCTD, 7th Inter IIT TechMeet, IIT Bombay	*Bombay, India*
2018	**Bronze Medal,** Technologies for Soldier Support, 6th Inter IIT TechMeet, IIT Madras	*Madras, India*
2018	**1st Position for 2 consecutive years,** Electrovate, Inter-Hostel Tech-Innovation Event, IIT Guwahati	*Guwahati, India*

Projects

Self-Balancing Cycle
IIT Guwahati, Guwahati, India

Design Project, EEE Department | 3 member team — *Jan. 2019 - May. 2019*

- Build an autonomous moving self balanced cycle using weight balancing as part of Course Project
- The cycle balanced itself using a controller which used the data from an IMU to predict its orientation and rotate an attached mass to balance the center of gravity of the cycle henceforth balancing the cycle.
- Worked on building the movable physical model and the electronic circuit for the senors and actuators.

Soil Nutrient Estimation Robot
IIT Guwahati, Guwahati, India

7th Inter IIT TechMeet | 5 member team | Github — *Nov. 2018 - Dec. 2018*

- 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 Colorimtery via a simple LDR and RGB-LED measures Nitrogen-Phosphorus-Potassium content in soil across farm lands.

Eye In The Sky
IIT Guwahati, Guwahati, India

7th Inter IIT TechMeet | 3 member team | Github — *Nov. 2018 - Dec. 2018*

- Achieved remote sensing of satellite data using deep learning semantic segmentation.
- Implemented 4 different algorithms UNet,PSPNet both with RGB Channels and One-Hot encoded channels.
- Trained on provided 13 images with 4 channels containing 8 classes.

ARLE(Automated Robot for Library Enchancement)
IIT Guwahati, Guwahati, India

4i Labs, IIT Guwahati | 9 member team | Github | Homepage | Youtube — *Jul. 2017 - PRESENT*

- This was a project undertaken to add to the already in-action automation of Library of IIT Guwahati
- Built a Four Wheeled Robot which can perform SLAM in library environment and reach the location of any specified book.
- Aimed at building a robot which can pick and place misplaced books in the library into their correct shelves.

Technologies for Soldier Support- Health Monitoring System
IIT Guwahati, Guwahati, India

6th Inter IIT TechMeet | 3 member team — *Dec. 2017 - Jan. 2018*

- Designed a human wearable suit 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 soldiers condition to base station.

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 - Apr. 2019	**Team Head,** ARLE, 4i Labs, IIT Guwahati	*Guwahati, India*