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 - 2020	*Guwahati, India*
IIT Guwahati, B.Tech Minor in Computer Sciences and Engineering	CGPA : 8.5/10	2017 - 2019	*Guwahati, India*

Skills

Robotics	ROS, OpenCV, Stereo Vision, Visual Odometry
Programming	Python, C++/C, Java, C#*
Hardware	Arduino, Raspberry-Pi, IMU Sensor, Camera, RGBD Camera, Actuators And Encoders
Machine Learning	Decision Trees & Random Forest, SVM, Neural Networks, CNNs, GANs*, RNNs*
Tools/Packages	Keras, Tensorflow, Unity3D*, Pytorch, Numpy, MatplotLib, Pandas, Gazebo*

Work Experience

Strato IT, Protec Inc. *Anyang, South Korea*
ROBOTICS & DEEP LEARNING INTERN *May 2019 - Jul. 2019*
- Implemented multiple **Deep Learning models for disparity estimation of stereo vision** in ease to use packaged **python modules**.
- Wrote **ROS packages** to test present hardware and software techniques in **visual and inertial odometry.**

AppSecure *Bengaluru, India*
API DEVELOPER & MACHINE LEARNING INTERN *May. 2018 - Jul. 2018*
- Implemented a combined package **software for active sub-domain and port scanning** for web-servers.
- Using the same **trained a model to predict the presence of a word** in the web-server directory or sub-domain.

Projects

Soil Nutrient Estimation Robot *IIT Guwahati, India*
7TH INTER IIT TECHMEET | 5 MEMBER TEAM | ⬡ GITHUB *Nov. 2018 - Dec. 2018*
- The robot collected **soil sample** and measured **nitrogen-phosphorus-potassium** content of **every 1 sq. meter** of farmland respectively.
- It performed **Colorimtery** using a **LDR and RGB-LED** on soil samples to estimate accurate fertilizer requirement for different farmland patches.

Eye In The Sky *IIT 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**.

ARLE(Automated Robot for Library Enchancement) *IIT Guwahati, India*
4I LABS, IIT GUWAHATI | 9 MEMBER TEAM | ⬡ GITHUB | 🏠 HOMEPAGE | ▶ YOUTUBE *Jul. 2017 - PRESENT*
- Built a **four wheeled robot** which can perform **SLAM and visual localization** in library environment according to any specified book.
- Wrote a **ROS package** to achieve the **visual odometry and mapping** mentioned using **LIDAR and RGBD Camera.**

Technologies for Soldier Support- Health Monitoring System *IIT Guwahati, India*
6TH INTER IIT TECHMEET | 3 MEMBER TEAM *Dec. 2017 - Jan. 2018*
- Designed a **suit** using **MPU9250, Temperature and Heart Rate Sensor** to predict the **physical state** of ability and inability of a soldier.
- Being **lightweight** and built with an **ESP8266** it **transmitted live condition** of the soldiers to base station.

Key Courses

Electrical & Electronics	Advanced Control Systems, 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	Basic Machine Learning, Artifical Neural Networks, Convolutional Neural Network & Computer Vision

Awards

2018	**Bronze Medal**, Tata Centre for Technological Development Challenge, 7th Inter IIT TechMeet, IIT Bombay	*Bombay, India*
2017	**Bronze Medal**, Technologies for Soldier Support, 6th Inter IIT TechMeet, IIT Madras	*Madras, India*
2017	**1st Position for 2 consecutive years**, Electrovate, 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 - Apr. 2019	**Team Head**, ARLE, 4i Labs, IIT Guwahati	*Guwahati, India*