Apoorva **Kumar**

Robotics Engineer · Machine Learning Enthusiast

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Education

Indian Institute of Technology, Guwahati   *Guwahati, India*

Bachelor of Technology   *2016 - Ongoing*

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

St. Michaels High School   *Patna, India*

Senior Secondary from CBSE   *2013 - 2015*

- **Grade : 95.2%**

Don Bosco Academy, Patna   *Patna, India*

Secondary from ICSE   *2002 - 2013*

- **Grade : 94.2%**

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 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.
- 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.

Projects

Soil 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*

4ı 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
- 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*

- Built a robust module to scan active sub-domains and ports for a web-server.
- Improved the above scanner using machine learning by predicting presence of more common words in a website back-end structure.
- 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*

- 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.

Key Courses

Electrical and Electronics

- Control Systems
- Discrete Time Control Systems
- Signals & Systems, Networks
- Principles of Communication
- 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
- 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
- Generative Adversarial Networks
- Optimization Techniques
- Convolutional Neural Networks
- Natural Language Processing

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*

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*