

# Aman Chandra

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## RESEARCH

### AERIAL ROBOTICS KHARAGPUR | STUDENT RESEARCH GROUP

March 2016 - Present | [Project Website](#)

Guided by: [Prof. Somesh Kumar](#) | [Prof. Jayanta Mukhopadhyay](#)

- Technologies: ROS, Gazebo, OpenCV, MATLAB, C++, Python.
- Working on **3D reconstruction of point cloud data** from stereo camera to implement **SLAM** and obstacle avoidance in outdoor environment.
- Developed algorithms for **vision based autonomous landing** of hexacopter on or in vicinity of mobile robotic platform.
- Designed **State Machine** for the system to participate in IARC 2017.
- [Team Description Paper](#) of IIT Kharagpur for IARC 2017.
- Implemented control systems and **obstacle avoidance** for the drone | [Link](#)
- Made a **two-layered PID controller** on MATLAB for testing purposes | [Link](#)

### SWARM ROBOTICS | STUDENT RESEARCH GROUP

March 2016 - Present | [Project Website](#)

Guided by: [Prof. Pallab Dasgupta](#) | [Prof. Somesh Kumar](#)

- Set up **mesh network** between robots using B.A.T.M.A.N. | [Link](#)
- Achieved communication between **decentralized robots** over WiFi using **protobuf** messages and **ignition transport**.
- Designed the **embedded stack** for the mobile robots | [Link](#)

## PROJECTS

- REINFORCEMENT LEARNING**  
Implemented **Q-Learning** algorithm on Arduino for a robot with a 2-DOF arm and an encoder to learn to crawl on its own | [Project Link](#)
- FIELD-PROGRAMMABLE GATE ARRAY**  
Implemented **UART Communication** and multiple combinatorial logic circuits on Arty Artix-7 FPGA | [Projects Link](#)
- WAREHOUSE RECONNAISSANCE DRONE**  
Designed and tested a line-follower and Bar code/ QR Code/ Hazardous Sign detector drone using **color segmentation** **attitude controller** and **template matching** for mapping inventory of a warehouse | [Project Link](#)
- 2D IMAGE STITCHING**  
Calculated **homographies** of multiple images to finally stitch them to get a panoramic view using **RANSAC** and OpenCV libraries | [Project Link](#)
- COGNITIVE MUSIC PLAYER**  
Designed an app as a part of **Microsoft Code.Fun.Do** using **Microsoft Cognitive Services** and **Firestore Cloud Storage** to play music based on user's facial expressions | [Project Link](#)

## WORK EXPERIENCE

### TECHNOLOGY ROBOTIX SOCIETY

Student Head | Jan 2017 - Present

- Official Android App:** Added **Firestore Authentication** portal, improved notification reception using **Firestore Cloud Messaging** and added **dynamic links** to tutorials from the official website | [Project Link](#)
- Mentored **IEEE workshops** on **Image Processing** (Scoring of live football match feed) and **Autonomous Robotics and Embedded Systems**.
- Leading a three tier team of 36 students towards the conduction of national level robotics events in techno-management fest, Kshitij, IIT Kharagpur.

## EDUCATION

### IIT KHARAGPUR

B.TECH+M.TECH IN BIOTECHNOLOGY  
Expected April 2020 | Kharagpur, India

### ST. MICHAEL'S HIGH SCHOOL

ALL INDIA SENIOR SCHOOL

CERTIFICATE

Grad. March 2015 | Patna, India

## SKILLS

### PROGRAMMING

Proficient:

C • C++ • MATLAB

Experience:

Java • Python • VHDL • CUDA

### ROBOTICS

ROS • Gazebo • Arduino • FPGA •  
MAVLink • rviz • Tensorflow • OpenCV

### TOOLS

Linux • GIT • Visual Studio • Docker

## COURSEWORK

### UNDERGRADUATE

Partial Differential Equations

Probability and Statistics

Electrical Technology

Basic Electronics

### MOOC

Algorithms

CNNs for Visual Recognition

Introduction to Computer Vision

Control of Mobile Robots

Machine Learning

## AWARDS

Jan 2018 | **Gold Medal** | Warehouse Inventory Check, 6th Inter IIT Technology Meet, 2018.

Aug 2017 | **Most Innovative Design Award** | 2017 Dream Angel Cup, International Aerial Robotics Competition, Beijing.

Oct 2016 | **Top 4 Teams** | National Autonomous Robotics Event, NSSC'16.

May 2015 | **Top 3% applicants** | Joint Entrance Exam conducted by IIT.