AMAN CHANDRA | 15BT30001

BIOTECHNOLOGY & BIOCHEM. ENGG. (M.Tech Dual 5Y)

EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2020	M.TECH Dual Degree 5Y	IIT Kharagpur	7.14 / 10
2015	All India Senior School Certificate Examination	St. Michael's High School, Patna	95.6%
2013	All India Secondary School Examination	St. Xavier's Hr. Sec. School, Bettiah	10 / 10

INTERNSHIPS AND PROJECTS

Capillary Technologies | Computer Vision Intern | May - July 2018

- **Technologies Used:** Python, Tensorflow, OpenCV, MATLAB, Darknet
- Developed and tested a **novel pedestrian detector** with state-of-the-art performance for **undistorted overhead fisheye images** based on modified and retrained versions of **YOLOv3** and **ACF**
- Conceptualized and implemented a **heirarchical Skew NMS** algorithm based on **skew-IOU** metric and clustering for filtering repeated detections at different orientations in overhead fisheye view
- Developed a **multi-person tracker** for overhead fisheye feed using **deep visual features** and Kalman Filter for data association
- Integrated the end-to-end tracking pipeline to work across **multiple super-wide fisheye cameras** in highly crowded scenes
- Working toward submitting a research paper based on the work at AAAI 2019

Swarm Robotics | Student Research Group | March 2016 - Present

- **Technologies Used:** C++, Python, ROS, OpenCV, Git
- Set up **wireless mesh network** between robots. and achieved decentralized communication using **protobuf** and **ignition transport**
- Stitched image feeds from multiple robots using homographies to get a **panoramic view** using **RANSAC** and OpenCV libraries
- Implemented **Q-Learning** algorithm on Arduino for a robot with a 2-DOF arm and an encoder to learn to crawl on its own

Aerial Robotics Kharagpur | Student Research Group | March 2016 - April 2018

- **Technologies Used:** C++, Python, ROS, Gazebo, MAVLink, rviz, Docker, Simulink, Git
- Worked on 3D reconstruction of **point cloud** from stereo camera for SLAM and obstacle avoidance in outdoor environment
- Built model of a quadcopter with **two-layered PID controller** in Simulink for testing its control and dynamics

COMPETITION/CONFERENCE

DRDO Robotics & Unmanned System Exposition, DIAT Pune | May 2018

- Secured **second position** at the National Level robotics competiotion organized by DRDO with 1088 nationwide entries
- Developed a **heterogenous swarm** consisting ground and aerial robots capable of multi-storey surveillance and soldier assistance

6th Inter IIT Technology Meet, IIT Madras | Jan 2018

- Secured the **Gold Medal** in the Warehouse Inventory Check event among the 13 participating teams from different IITs
- Developed an indoor **reconaissance drone** capable of autonomous flight over a grid of colored lines drawn on the floor
- Implemented Barcode/ Hazardous Sign detector on the drone for automated inventory management using OpenCV libraries

International Aerial Robotics Competition, Beijing | August 2017

- Represented institute as a part of the 6 member team securing **Most Innovative Design** award among 20 teams from 7 countries
- Developed and tested control system for aerial-ground robot interaction using PID and various path planning algorithms
- Implemented algorithm for **vision-based landing** a hexacopter on or in vicinity of a mobile robotic platform
- Designed **State Machine** for the entire software stack

Microsoft code.fun.do, IIT Kharagpur | Oct - Nov 2016

- Successfully completed the round one of the in-house week-long hackathon organized by Microsoft
- Developed a music player based on user's facial expressions using Microsoft **Cognitive Services** and **Firebase Cloud Storage**

COURSEWORK INFORMATION

- **Undergraduate :** Partial Differential Equations, Probability and Statistics, Basic Electronics, Programming and Data Structures, Computational Neuroscience^, Image Processing^
- **MOOC** : Introduction to Algorithms, Mathematics for Computer Science, Introduction to Computer Vision, CNNs for Visual Recognition, Control of Mobile Robots, Machine Learning^

^ Ongoing Courses

POSITIONS OF RESPONSIBILITY

Technology Robotix Society | Governor | Feb 2018 - Present

- Spearheading the official robotics group of the institute responsible for all robotics activities on campus
- Led the 3-tier team toward conduction of national level robotics events in the institute's techno-management fest, Kshitij 2018
- In the official android app of the society, added **Firebase Authentication Portal**, improved notification reception using **Firebase Cloud Messaging** and added dynamic links to tutorials from the official website

IEEE Workshops | Mentor | December 2016

- Mentored a group of 120 students toward successful completion of workshop on Image Processing
- Mentored a group of 40 students toward successful completion of workshop on Autonomous Robotics and Embedded Systems

EXTRA CURRICULAR ACTIVITIES

- Led an awareness and social service group of 70 students under Naional Service Scheme, IIT Kharagpur
- Won multiple elocution contests in English as well as Hindi at school and district levels
- Participated in Table-Tennis tournaments at school and inter - hall levels