AMAN CHANDRA

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EDUCATION

Year	Degree/Exam	Institute
2020	B.Tech + M.Tech Dual Degree	Indian Institute of Technology Kharagpur
2015	All India Senior School Certificate Examination	St. Michael's High School, Patna

INTERNSHIPS AND PROJECTS

Capillary Technologies | Computer Vision Intern **May - July 2018**

- Developed end-to-end **pedestrian tracking** pipeline, working across **multiple super-wide fisheye cameras** in crowded scenes
- Built a **novel pedestrian detector** for **undistorted overhead fisheye images** using modified, retrained versions of **YOLO** & **ACF**
- Conceptualized a **Hierarchical Skew NMS** algorithm based on **skew-IOU** to filter repeated detections at varying orientations
- Designed a **multi-person tracker metric** for Hungarian data association using **Deep Visual Features** and **Kalman Filter**
- Working toward submitting a research paper based on the work at a leading machine learning/ computer vision conference

Protein Structure Prediction | Bachelor's Thesis **Mar 2016 - Present**

- Working toward improving prediction of super-secondary and further tertiary structure of proteins from the peptide sequence
- Reviewed and implementing multiple algorithms based on LSTMs and Reinforcement Learning to approach the problem

Swarm Robotics | Student Research Group **Mar 2016 - Present**

- Set up **wireless mesh network** b/w 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 **Mar 2016 - Apr 2018**

- Worked on 3D reconstruction of **point cloud** from stereo camera for SLAM and obstacle avoidance in outdoor environment
- Engineered mechanism for **automated parachute deployment** in a copter as a safety fallback in case of motor failure or crash
- Built mathematical model of a quadcopter with **two-layered PID controller** in Simulink for testing its control and dynamics

COMPETITION/CONFERENCE

DRDO Robotics & Unmanned System Exposition (DRUSE), DIAT Pune **May 2018**

- Secured **second position** at the National Level robotics competition organized by DRDO with 1088 nationwide entries
- Developed **heterogeneous swarm** of ground & aerial robots capable of multi-storey surveillance & soldier assistance
- Implemented a fast 2D map merging algorithm for cooperative multi robot SLAM for scalable mapping of large environments

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 reconnaissance drone** capable of autonomous flight over a grid of colored lines drawn on the floor
- Submitted a research paper based on the novel implementation of inventory management using drones at **IEEE IRC 2019**

International Aerial Robotics Competition, Beijing **Aug 2017**

- Represented institute as 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 and simulated algorithm for **vision-based landing** of a hexacopter on or in vicinity of a **mobile robotic platform**

SKILLS AND EXPERTISE

- **Programming Languages** : C++, Python, C, MATLAB, Java, VHDL
- **Tools and Libraries** : Tensorflow, Darknet, OpenCV, Simulink, Docker, Git
- **Robotics and Hardware** : ROS, Gazebo, MAVLink, rviz, Arduino, FPGA
- **Undergraduate Courses** : Partial Differential Equations, Probability and Statistics, Basic Electronics, Programming and Data Structures, Computational Neuroscience*, Image Processing*
- **Massive Open Online Courses** : Introduction to Algorithms, Mathematics for Computer Science, Introduction to Computer Vision, CNNs for Visual Recognition, Control of Mobile Robots, Machine Learning*

POSITIONS OF RESPONSIBILITY

Governor, Technology Robotix Society **Mar 2018 - Present**

- Spearheading the official robotics group of the institute responsible for all robotics related activities on campus
- Launched the **Makerspace Lab** in the institute with free software and hardware resources for all of the student community
- Led the 3-tier team toward conduction of national level robotics events in the institute's techno-management fest, Kshitij 2018

Mentor, IEEE Workshops **Dec 2016**

- Mentored group of 40 students toward successful completion of workshop on Autonomous Robotics and Embedded Systems
- Realized the problem statement of making a Motion Imitating robot using human gestures or another bot's motion on ATMega