

Kumar Ankit

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EDUCATION

IISC BANGALORE

PH.D. IN CYBER PHYSICAL SYSTEMS

Expected Apr 2023 | Bangalore, IN

Cum. GPA: 8.04/10.0

IIT KHARAGPUR

BTECH (BACHELOR'S) IN MINING
ENGINEERING

Apr 2018 | Kharagpur, IN

Cum. GPA: 8.27/10.0

MUNAM PUBLIC SCHOOL

Grad. March 2014 | Hazaribag, India

12th Grade CBSE: 90%

State Level Green Olympiad

SKILLS

PROGRAMMING

C • C# • Python • Beaglebone
Odroid • Raspberry Pi • ATmega
Arduino

TECHNICAL

Wireless Networks • Basic Electronics

SOFTWARES

Proteus • Solidworks • PSpice
Eagle PCB Design • Excel • Powerpoint

AWARDS & HONORS

Gold Medal - Inter IIT Tech-Meet 2017,
IIT Madras, Autonomous Toilet Cleaning

Gold Medal - Inter IIT Tech-Meet 2016,
IIT Kanpur, Product Design

Gold Medal - Tech Championship, 2016,
Product Design | AISD

Gold Medal - Product Design - Open IIT
Silver Medal - Tech Championship 2015,
Hardware Modelling | THAWR

Best Fresher - Azad Hall of Residence,
I.I.T. Kharagpur for the session 2015-16

Silver - Street Play at IIM Calcutta

CO-CURRICULARS

Participated in Open IIT **Hindi Elocution**

Participated in **Hall Dramatics**

Participated in **Minefield Robotics Event**

Stage actor at **English Technology**

Dramatics Society, IIT Kharagpur

PUBLICATIONS

Multi-Agent Collaboration for Building Construction | MBZIRC Conference

Feb 2020 | ADNEC, Abu Dhabi, UAE

- **Task planner** for vehicle collaboration in building a structure
- Involves repeated **pick-and-place** operations using UAVs and UGV
- Implemented using the Robot Operating System (**ROS**) framework in Gazebo simulation environment

Multi-Agent Collaborative 3D Mapping | In Progress

- Aimed to **fuse** the map generated by a UAV and UGV separately
- **Geo-referenced** detailed 3D map (coloured point cloud) is being generated
- Fusing the aerial canopy view by UAV with the detailed closeup view of the rows by UGV

EXPERIENCE

Swarm Robotics, IIT Kharagpur | Sub-Head (Embedded Electronics)

Feb 2015 - Feb 2017 | Kharagpur, IN

- Designed robust **intra-communication** protocol for independent robots
- Responsible for and **managed** a team of 8 members during the tenure

Aerial Robotics, IIT Kharagpur | Sub-Head (Controls)

Feb 2015 - Feb 2017 | Kharagpur, IN

- Represented India in **IARC (International Aerial Robotics Competition) 2016, Beijing, China** and were awarded the Best Team Cooperation Award
- **Responsible** for a team of 7 members and task delegation, procurements etc

Kharagpur Robosoccer Students Group

Feb 2015 - Feb 2016 | Kharagpur, IN

- Interfaced Wireless Modules: Xbee & NRF, which includes **efficiency**, data-loss over distance & Brushless Maxon Motors using ESC & Gate Driver
- Designed **main circuit** for FIRA robots using Eagle PCB Design & Schematic

PROJECTS

VEHICLE DETECTION & CLASSIFICATION IN AERIAL IMAGES

Given with **aerial** images, the task was to detect and classify the vehicles on highway based on their size, number of wheels etc. using **YOLOv3**

INDOOR LOCALIZATION AND PATH PLANNING

The project dealt with the basics of mapping, **vision-based** localization and path planning for a **GPS-denied** environment

DEEP RL FOR HIGH PRECISION TASKS

In this project, a high precision benchmark problem "Peg in hole" was solved using a deep **RL** architecture

DMD-MPC: AN ONLINE LEARNING APPROACH TO MPC

In this work, an online learning perspective to **model predictive control** has been applied and tested on non-linear control problems

TEACHABLE HUMAN AUGMENTED WORKSTATION ROBOT

Made a **humanoid voice-interfaced** wireless robot (THAWR) aimed to serve in rescue & heavy-duty industrial operations

AUTONOMOUS TOILET CLEANING ROBOT

Created a **autonomous** toilet cleaning robot capable of detecting and cleaning english toilet seat in minutes using **Deep Learning** algorithms