NAVEEN CHANDRA R

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EDUCATION

2016–present	**B. Tech - M. Tech**, *Indian Institute of Technology*, Kanpur - 6.99/10 Major: Aerospace Engineering
2016	**Grade XII**, *Maharirshi International Residential School*, Chennai, *Result- 92.2%*
2014	**Grade X**, *SVEI Public School*, Mysore, *CGPA- 10/10*

RESEARCH EXPERIENCE

Jan '17–Present
Report

Autonomous Underwater Vehicle (AUV)

IIT Kanpur, Prof. Mangal Kothari
- **Design and Manufacture** of a new Autonomous Underwater Vehicle *Anahita*, which uses computer vision, hydrophone array, DVL and IMU for navigation
- Developed a new **grabber mechanism** capable of picking objects of any random shape using a **single actuation**
- **Optimized the Vehicle Design** using Flow and Structural Analysis in **Ansys**
- Design and Manufacture of **Waterproof casings** for various sensors and electronics, which are highly compact and modular using **Solidworks**
- Trained and implemented a **YOLO-V3** network for underwater object detection.
- Working on improving the controller of the vehicle that includes a DVL to achieve better motion capabilities of the vehicle with accurate position estimation

Aug '19–Present

Swarm Robotics

IIT Kanpur, Prof. Mangal Kothari
- Developed code for autonomous swarm of 10 Drones and handle formation control
- Develop path planing algorithm for a disaster stuck GPS denied environment
- Improve the position accuracy of the nodes while flying at a high altitude using features captured by the bottom facing camera

PUBLICATION

Link

Design and Development of an Open-frame AUV: ANAHITA

By Akash Jain, Naveen Chandra R, Manish Kumar in IEEE OES Symposium 2018

COURSE PROJECTS

Jan '19–Apr '19

Horn Schunck Optical Flow with a Multi-Scale Strategy

Course Project for Autonomous Navigation, Prof. Mangal Kothari
- Studied the classic Horn and Schunck method of optical flow
- Created a ROS package to capture images from camera and calculate its optical flow
- Experimented with the parameters that handles the Multi-Scale Strategy and calculated the optical flow that closely matches the Ground truth

Aug '18–Sept '18

Sliding-Mode Controller for an Uncertain Underwater Robot

Course Project for Basics of Modern Control Systems, Prof. Ramprasad Potluri
- Studied the dynamics of an Underwater Vehicle used CFD techniques to understand the parameters affecting the vehicle dynamics
- Simulated a Sliding Mode Controller in MATLAB, for the vehicle to perform simple motions

ACADEMIC ACHIEVEMENTS

2016	**All India Rank 2022** in JEE Advanced among 198,000 students
2016	**All India Rank 9776** in JEE Mains among 1.13 million students

Technical skills

Software:	SolidWorks, Ansys Workbench, LabView
Languages:	Python, C++, C
Frameworks:	ROS, Pixhawk, Arduino IDE
Other:	OpenCV, MATLAB, Git, LaTeX

Relevant Coursework

Robotics:	Visual Recognition, Autonomous Navigation, Basics of Modern Control System, Rigid Body Dynamics, Autonomous Unmanned Aerial Systems, Non-linear Systems*, Formal methods for Robotics and Automation*
Mathematics:	Linear Algebra, Ordinary/Partial Differential Equations, Probability and Statistics, Complex Variables
Others:	Fundamentals of Programming, Signals Systems and Networks, Helicopter Theory, Flight Mechanics

* To be completed in Spring 2020

Positions of Responsibility

May '19–Present **Team Captian**, *AUV Team*, IIT Kanpur
- Managing a team of more than **20 members** over the technical aspects of the project
- Brought in sponsorship from companies Solidworks, Ansys and IDS Imaging Systems
- Starting initiatives in order to extend the Underwater Research outside our institution
- Managing a fund of **INR 2,300,000** for heading the team into research on real world problems

Jul '18–Apr '19 **Mechanical Head**, *AUV Team*, IIT Kanpur
- Managed a team of 12 members to build a new vehicle that greatly surpasses the capabilities of our previous vehicle
- Trained 7 freshmen and mentored them in Design and Development of a new Underwater Vehicle

Jul '17–Mar '18 **Secretary**, *Robotics Club*, IIT Kanpur
- Promoting Robotics in campus community by organizing **workshops and lectures**
- Assisted the Coordinators in **organizing competitions** in Major technical events

Miscellaneous

Jul '19 Led the team **AUV-IITK** to our first ever participation in an International Robotics Competition at the **Robosub 2019** held in San Diego, California

Jan '19 Runner up at the **Final Round** of NIOT SAVe 2019, **Indian National Competition** on **Student Autonomous Underwater Vehicle Challenge** held in Chennai

Sept '18 Presented a poster at the **2018 IEEE OES Autonomous Underwater Vehicle Symposium** held at Porto, Portugal

Jul '18 Participated in **IEEE OES** workshop held in NIOT, Chennai on July 31

Jul '18 Conducted **workshop** on using **ANSYS Fluent** to simulate flow past a body