

# Vaibhav Raheja

✉ vaibhavvraheja@gmail.com | 📞 +1(217)-202-9970 | 🌐 Vaibhav Raheja | 📱 Vaibhav-Raheja | 🌐 Portfolio

## EDUCATION

<b>University of Illinois Urbana-Champaign</b> , <i>Masters Degree</i>	08/2023 - 12/2024
Major: Autonomy and Robotics	CGPA: 3.77/4
<b>NMIMS' MPSTME</b> , <i>Bachelors Degree</i>	07/2017 - 06/2023
Major: Computer Engineering	CGPA: 3.18/4
<b>NMIMS' MPSTME</b> , <i>Diploma Certificate</i>	07/2017 - 06/2023
Major: Computer Engineering	

## WORK EXPERIENCE

<b>Intelligent Motion Laboratory</b> , <i>Research Developer</i>	08/2023 - 12/2023
<ul style="list-style-type: none"><li>– Implemented FaceMesh, OpenFace 1.0, and DeepFace for face detection for a robotic eye exam.</li><li>– Developed head pose estimation techniques using ZED camera's depth tracking of facial features.</li><li>– Analyzed FaceMesh and OpenFace 1.0 face detection models for accuracy and adaptability in various scenarios.</li><li>– Designed and simulated a robotic arm, optimizing camera placement for effective 3D mapping.</li><li>– <b>Technologies Used:</b> Python, Robot Operating System (ROS), CAD.</li></ul>	
<b>All India Institute of Medical Sciences (AIIMS) Hospital</b> , <i>Research Intern</i>	02/2021 - 05/2023
<ul style="list-style-type: none"><li>– Collaborated with a multidisciplinary team on the development and execution of a pioneering research project funded by the Indian Council of Medical Research (ICMR), resulting in a 15% reduction in surgery duration and a 20% increase in surgical precision.</li><li>– Played a pivotal role in the design and assembly of a custom 2-directional catheter and mouthpiece integrated with a camera system, contributing to successful intubation.</li><li>– <b>Technologies Used:</b> Python, 'xArm 5' robotic arm, Machine Learning, Robot Operating System (ROS), CAD.</li></ul>	
<b>Granuler: CIO Consulting</b> , <i>Intern</i>	01/2020 - 05/2020
<ul style="list-style-type: none"><li>– Successfully implemented a CRM (Customer Relation Management) system using HubSpot CRM, streamlining workflow and increasing efficiency by 40% and Automated CEO's tasks using UiPath for Robotic Process Automation (RPA), resulting in at least 20% saving in resources.</li></ul>	

## PROJECTS

<b>Intelligent Ground Vehicle Competition (IGVC)</b> ,   ( <i>ROS, OpenCV, PID Control, Path Planning, CAD</i> )
<ul style="list-style-type: none"><li>– Managed a multidisciplinary team as Co-Captain for this international robotics competition held in Detroit, USA. As Co-Captain of Team D.A.R.V.I.N, we achieved impressive 2nd and 3rd place rankings in the highly competitive Cyber and AutoNav Challenge categories, demonstrating our excellence in autonomous vehicle navigation in challenging environments.</li></ul>
<b>Autonomous Driving Car</b>   ( <i>Python, Path Planning, Vehicle Control, CARLA Simulator</i> )
<ul style="list-style-type: none"><li>– Engineered path planning and control algorithms for an autonomous racing car in the CARLA simulator. Implemented Hybrid A* search for waypoint navigation for racetracks.</li><li>– Implemented a Proportional-Derivative (PD) controller for real-time autonomy with obstacle avoidance and adjustments of steering angle, speed, and braking, enhancing the car's efficient navigation through racetracks.</li></ul>
<b>Soft Robotics Hand</b>   ( <i>Arduino, 3D Modelling and Printing</i> )
<ul style="list-style-type: none"><li>– Created a Soft Robotic Hand controlled by five individual stepper motors, enhancing dexterity and flexibility, with Arduino for control and 3D modeling and printing for construction.</li></ul>
<b>Custom Surveillance Drone</b>   ( <i>Arduino, 3D Modelling and Printing, ESC Controller, Pix hawk</i> )
<ul style="list-style-type: none"><li>– Engineered a custom surveillance drone featuring a modular 3D-printed body and high-performance 1200KV BLDC motors, controlled via a Pix hawk Flight Controller and an ESC for motor control.</li></ul>

## SKILLS

Programming:	Python, C++, Robot Operating System(ROS), OpenCV, PyTorch, PID Controllers, Motion Planning algorithms, Machine Learning(ML), CNN
Tools:	Autodesk Fusion 360, Computer Aided Design (CAD), Linux, Git, Arduino, Raspberry Pi

## PUBLICATIONS

Raheja, Vaibhav et al. (Nov. 2022). "Multi-Disease Prediction System using Machine Learning". In: <i>International Conference on Futuristic Technologies (INCOFT)</i> . URL: <a href="https://ieeexplore.ieee.org/document/10094382">https://ieeexplore.ieee.org/document/10094382</a> .	
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