








Rohit Menon

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PROFESSIONAL SUMMARY

With over 6 years of industry experience, I excel in integrating mechanical and robotic systems with hardware and software development, focusing on autonomous systems.

TECHNICAL SKILLS

- Engineering Design & Manufacturing:** Ansys, AutoCAD, Autodesk Fusion 360, Blender3D, CATIA, Computational Fluid Dynamics (CFD), Creo, Factory Acceptance Testing (FAT), Factory Layout Design, Finite Element Analysis (FEA), Geometric Dimensioning & Tolerancing (GD&T), Process Failure Modes and Effects Analysis (PFMEA), Programmable Logic Controller (PLC), Solidworks.
- Programming Languages & Frameworks:** C, C++, Docker, Embedded C, Linux, Matlab & Simulink, Python, ROS, ROS2.
- Libraries & Simulations:** CARLA, Gazebo, Isaac Sim, Matplotlib, NumPy, Omniverse, OpenCV, Pandas, PyTorch, Scikit-learn, TensorFlow.
- Tools & Technologies:** Arduino, ARM Cortex-A, Automation Studio, Autoware, BeagleBone, Controller Area Network (CAN) Communication, Raspberry Pi, Unreal Engine, Vehicle Integration.

PATENT

Electromechanical Heart – Total Artificial Heart (TAH) – Patent No. 201741000649A

- Engineered and developed an advanced TAH prosthetic device that mimics natural heart functions, acting as a bridge to heart transplants.
- Granted: September 23, 2024

PROFESSIONAL EXPERIENCE

Industrial Engineer (Automation)

July 2024 – August 2024

Trinity Frozen Foods

Pembroke, NC, USA

- Engineered the Cognex vision system for the detection and sorting of products.
- Engineered the FANUC DR-3iB/8L Delta Robot for high-speed pick and place operations and the FANUC M-410iB/700 Palletizing Robot for heavy-duty material handling.
- Troubleshoot and resolved issues in mechanical and electrical components, including PLCs, which reduced downtime by 16%.
- Started shifts by configuring and enabling various production and packaging machines, ensuring correct setup through the (HMI) for the product and target quantity.
- Conducted hourly quality checks, managed necessary documentation, and executed the Clean-in-Place (CIP) process weekly to uphold safety and cleanliness standards.

Graduate Services Assistant - Grader/Lab Assistant

August 2023 – December 2023

Arizona State University

Tempe, AZ, USA

- Led programming initiatives for the MYCOBOT, a 6-DOF collaborative robot, focusing on arm calibration, manipulation, kinematics, color recognition, and object detection leveraging YOLOv5. Developed a Python-based controller for autonomous tic-tac-toe playing.
- Directed programming projects in robotic manipulation, improving dynamics and precision in navigation, and process enhancements in palletizing and assembly using Universal Robots UR3/e and UR5/CB-3 series.
- Led the Manufacturing Automation Technology Open House, demonstrating industrial automation technologies, including the use of robotic arms for manufacturing efficiency, showcased to students across multiple disciplines.

Product Engineer

January 2019 – July 2022

Xdroid Prototyping Technologies LLP

Bengaluru, KA, India

- Spearheaded the development of innovative products and systems focusing on cutting-edge 3D printing and additive manufacturing technologies, including rapid prototyping and reverse engineering.
- Designed and developed custom FDM, SLA, SLS 3D printers tailored to client specifications and integrated a PLC system into an industrial 3D printer.
- Engineered a Concept SpeedGate for the UAE Ministry and developed a real-time Thermal and Humidity Control System for the Indian Space Research Organization's Human Space Flight Centre.

Mechanical Engineer

January 2018 – December 2018

Flux Auto

Bengaluru, KA, India

- Designed and developed retrofit solutions in SolidWorks for vehicle controls (throttle, brakes, steering, transmission) and sensor housings (cameras, LIDAR, radar).
- Conducted FEA, CFD, and Fatigue Analyses, achieving a 90% success rate, significantly contributing to the development of mechanical components for autonomous vehicles.
- Carried out data analyses on sensors, GPS & mapping, telematics data, and performed object & event detection.

Mechanical Site Engineer

January 2017 – January 2018

Ramkrishy Infrastructure Pvt. Ltd

Bengaluru, KA, India

- Utilized 2D and 3D CAD/CAM software proficiently for precise plant designs.
- Coordinated mechanical system designs in project planning meetings, resolving conflicts, and aligning delivery schedules.
- Identified mechanical process deficiencies and contributed improvement strategies to senior engineers.

RESEARCH PROJECTS

Researcher (Volunteer) - Robotics and Autonomous Systems Laboratory

September 2024 – Present

Prof: Dr. Xi Yu - Assistant Professor

Arizona State University

Mesa, AZ, USA

Development of an Autonomous Blimp for Swarming Navigation and Object Collection

- Currently designing and building an autonomous blimp capable of independent navigation in airspace while facilitating communication with other blimps for swarming behavior. The primary objective is to efficiently locate and collect balloons, guiding them through a designated goal post.
- Implementing advanced object detection algorithms to identify and avoid collisions with surrounding obstacles, while accurately detecting and grasping balloons using a custom net integrated into the blimp design.
- Leveraging Python, OpenCV, and simultaneous localization and mapping (SLAM) techniques for enhanced navigation and object interaction capabilities.

- The project incorporates advanced robotics components, including brushless motors, ESCs, a Raspberry Pi, various sensors, and a camera system, to enable autonomous navigation and balloon collection.

Researcher (Volunteer) - Robotics and Autonomous Systems Laboratory
Prof: Dr. Sangram Redkar - Associate Director and Professor
Arizona State University

May 2024 – Present

Mesa, AZ, USA

Development of a Real-Time Digital Twin for Glove Compartment Automation

- Currently integrating the ZED 2i stereoscopic camera and Livox MID-70 LiDAR for advanced sensor fusion to accurately detect and track transparent objects. Employing two UR5 robots with Robotiq 2F-85 grippers to execute precise and complex tasks, including pick and place operations, grainy material scooping, and careful manipulation tasks without displacing contents.
- Utilizing Wandel scripts for real-time control of the manipulators, incorporating camera and LiDAR fusion point cloud data for enhanced detection and tracking capabilities. Implementing in-house multimodal large language models (LLMs) for conformal coordinate prediction.
- Leveraging ROS, RViz with MoveIt, NVIDIA Omniverse for collaborative simulation, Isaac Sim for high-fidelity robotics simulation, and Python scripting for the real-time development and simulation of the digital twin.
- Utilizing the NVIDIA Jetson Nano processing device to handle computational tasks and enable efficient real-time data processing and analysis.

Research Assistant - Dynamic Systems and Control Laboratory
Prof: Dr. Yan Chen - Assistant Professor
Arizona State University

January 2024 – May 2024

Mesa, AZ, USA

Remote-Control of an Off-Road Automated Vehicle over the 5G-Network for Agriculture Applications

- **Funded by the ASU Master’s Opportunity for Research in Engineering (MORE) Program and nominated for the Best Research Award, this project ranked among the top 5 out of 140 projects in Spring 2024. It was also featured on the Fulton Forge Student Research Expo website and catalog.**
- Developed a robust control system for an automated off-road vehicle (Jeep Grand Cherokee) powered by 5G technology. This involves utilizing Matlab/Simulink/ROS for system integration, interfacing the vehicle’s control units and sensors with New Eagle’s drive-by-wire system, dSPACE MicroAutoBox II, and Swift Navigation GNSS GPS500 via CAN Bus, and incorporating an HMI display for real-time monitoring and interaction.
- Incorporated an intuitive joystick-based remote control and live-feed cameras for tele-operation and integrated an HMI (Human-Machine Interface) for real-time vehicle feedback.
- Designed the hardware mounts and constructed a rig to support all the hardware components using SolidWorks.

ACADEMIC PROJECTS

- **Driver Monitoring System for Embedded Devices:** To enhance driver safety by detecting and responding to signs of driver fatigue or distraction using real-time video analysis.
- **Word Recognition using Machine Learning on Arduino:** To implement a compact and efficient voice recognition system for triggering actions based on specific spoken words, useful for various embedded applications.
- **Posture Detection using Embedded Machine Learning:** To monitor and analyze sleeping postures in real-time, providing data that can help improve sleep quality and health through advanced posture detection.
- **Automated Sorting System with PLC and Cobot Integration:** To automate the sorting process in manufacturing by integrating PLCs and cobots, improving efficiency and accuracy in sorting operations.
- **Learning-Based Adaptive Control using Reinforcement Learning with Model Predictive Control:** To develop a more responsive and adaptive vehicle control system that improves handling and stability by learning from and adapting to various driving conditions.
- **Advanced Control and Navigation of Parrot Mambo Mini Drone:** To enhance drone autonomy and precision in flight control and navigation, enabling complex maneuvers and tasks through improved control algorithms and computer vision.
- **Ultrasonic Radar:** To create a cost-effective and reliable system for detecting and mapping objects within a 360-degree range, applicable in various fields such as robotics and security.
- **Vertical Drawing Robot:** To build a robot capable of drawing complex images on vertical surfaces with high precision, demonstrating advanced control and path planning techniques.
- **Webcam Controlled Rover:** To develop a rover that can autonomously navigate and manipulate objects based on real-time visual input from a webcam, showcasing image processing and autonomous control capabilities.
- **Self-Balancing Motorcycle:** To design and implement a self-balancing motorcycle that maintains stability and performs controlled maneuvers, demonstrating principles of dynamic balance and control in two-wheeled vehicles.

EDUCATION

Master of Science in Robotics and Autonomous Systems, Systems Engineering
Ira A. Fulton Schools of Engineering, School of Manufacturing Systems and Networks
Arizona State University, Tempe, AZ, USA

August 2022 – May 2024

GPA: 3.97/4.0

Bachelor of Technology in Mechanical Engineering
SunRise University, Alwar, RJ, India

June 2012 – June 2016
CGPA: 6.4/10.0

TECHNICAL CERTIFICATIONS

- **Training, Licenses and Certification Collection**