

DINESH SAI RALLAPALLI

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SUMMARY

Robotics Engineer with around 3 years of Experience delivering innovative solutions through advanced algorithmic development and intelligent system design. Proficient at optimizing autonomous navigation, implementing sophisticated control systems, and reducing development cycles through cutting-edge simulation techniques and cross-functional collaboration.

SKILLS

Programming: Python, C++, C, MATLAB

Libraries & Frameworks: Eigen, Pinocchio, PyTorch, TensorFlow, OpenCV, Robot Operating System (ROS, ROS2)

Core Robotics: Kinematics, Robot Control (PID, MPC, LQR), Trajectory Optimization, State Estimation (Kalman Filters, UKF, EKF, Particle Filter), SLAM, Perception, Motion Planning, Multi-Body Dynamic Systems, Mobile Robotics

AI/Machine Learning: Deep Learning, Reinforcement Learning, Convolutional and Recurrent Neural Networks (CNNs, RNNs)

Hardware Integration: Sensor fusion (IMUs, Gyroscopes, Accelerometers, LiDAR, GPS, Vicon), Actuator Integration (Servos, Motors)

Embedded Systems: NVIDIA Jetson Nano, Raspberry Pi, Arduino, SPI, I2C, UART, USART, TCP/IP, RTOS

Simulation, Modelling & Design: MuJoCo, Gazebo, Rviz, Simulink, Autodesk Fusion 360, SolidWorks (CAD), Git, CI/CD

EDUCATION

M.S in Mechatronics and Robotics Engineering

May 2025

New York University, New York, US

Relevant Coursework: • Manipulator Kinematics & Dynamics • Robot Localization & Navigation • Mapping • Mechatronics • Computer Vision • Controls

B.E in Electronics and Communication Engineering

Jun 2022

Chandigarh University, Chandigarh, IN

Relevant Coursework: • Embedded Systems • Electromagnetism • Analog & Digital Circuits • Computer Networks • Digital Signal Processing • VLSI

WORK EXPERIENCE

New York University, New York, US

Sep 2024 - May 2025

Graduate Assistant

- Guided mechanical and mechatronics lab operations for 800+ students in robotics and circuit-design projects using SOP-driven workflows and data-driven scheduling, applying QA practices and troubleshooting integration challenges to boost efficiency by 30%.
- Streamlined lab operations by managing the maintenance and calibration of 15+ advanced Mechanical equipment (CNC machines, 3D printers, welding rigs, and laser cutters), ensuring high precision and operational efficiency for interdisciplinary engineering projects.

KPMG IN, Hyderabad, India

Jan 2022 - Aug 2023

Analyst

- Pioneered the creation of a Robotic Process Automation (RPA) solution using UiPath to automate multi-platform workflows (reports and presentations across PowerPoint, Excel, Word, PDF, web applications), achieving a 33% reduction in production time.
- Deployed "KeVal," an enterprise-level Computer System Validation (CSV) tool for the pharmaceutical industry, generating \$40K in revenue via client leasing. Enhanced operational efficiency using PowerApps, Dataverse, SharePoint, and Power BI.

PROJECTS

7-DOF Manipulator: Vision Segmentation & Force-Torque Optimized Trajectory (Python, Robosuite, MuJoCo - [GitHub](#))

- Engineered a real-time 7-DOF arm pipeline integrating vision-based mask detection with 6-axis force-torque feedback, reducing path-planning latency by 30% across 20+ simulation runs.
- Implemented a 10-step horizon MPC controller to optimize manipulator motion, cutting execution time by 20% and boosting trajectory smoothness by 25%.

Applied Dynamics and Optimization of Humanoids (Python, MuJoCo, Biped, MPC, PD, ZMP, Eigen, Pinocchio - [GitHub](#))

- Developed a 20-DOF humanoid robot model in MuJoCo with Python, integrating LIPM, ZMP and a 10-step horizon MPC, boosting stable walking efficiency by 25%.
- Optimized C++ control algorithms using Eigen and Pinocchio, enhancing simulation accuracy by 30% through advanced inverse kinematics and manipulator control.

Sensor Fusion for Localization and Motion Control (Kalman Filters, EKF, UKF, Optical Flow, RANSAC - [GitHub](#))

- Customized EKF and UKF for localization with Vicon and onboard IMU sensors, achieving 80% accuracy in live environments.
- Applied Optical Flow and RANSAC for velocity estimation and outlier rejection, improving pose estimation accuracy by 60%.

Multi Modal Robot-Ground/Aerial (C++, PID, Raspberry Pi, IMU, Actuators - [GitHub](#))

- Built a dual-mode robot with seamless ground-to-aerial transition, improving responsiveness by 30%.
- Integrated IMU sensors with a PID controller, boosting motion tracking precision and system efficiency by 25%.

ACHIEVEMENTS

Leadership: Co-Founder & President of Dravida Club at Chandigarh University, growing membership to 800+ members.

Competition: National Runner-Up in Smart India Hackathon-2020 (Hardware Edition) among 200+ teams.

Scholarship: Awarded a 100% Government of India scholarship for Master's at NYU, ranking in the top 0.5%.