Ravi Teja Kolli

737-356-1044 | rvtj17@gmail.com | www.linkedin.com/in/ravitejakolli/

Education

University Of Delaware — Newark, DE
Master of Science in Robotics and Automation — *December 2024*

Riga Technical University — Riga, Latvia
Master of Science in Engineering Technology and Mechanical Engineering — *Jan 2022*

Vignan Institute of Technology and Science — India, Hyderabad
Bachelor of Technology in Mechanical Engineering — *May 2019*

Experience

Robotics Software Intern — Sept 2024 – Present
Unlimited Robotics — *Philadelphia, US*

- Developed effective software solutions for a health care robot integrating sensor fusion for precise localization, real-time obstacle avoidance algorithms, and path planning optimization with SLAM based 2D mapping and 3D localization. Debugged robotic arm operations resolving navigation and operational challenges while demonstrating problem-solving skills.
- Utilized ROS2 and debugging techniques like Gazebo simulation testing and fault injection to optimize autonomous navigation. Applied ROS2 tracing for performance analysis. Developed interfaces with NATS and gRPC, ensuring seamless robot-hospital communication and real-time data exchange.
- Integrated EKF-based localization and multi-floor elevator access, tuning motion profiles for smooth vertical transitions.

Automation Engineer II — Jan 2022 – Jan 2023
Pragati Offset Pvt.Ltd — *Hyderabad, India*

- Implemented automation solutions using Allen Bradley PLC and ladder logic, integrating conveyors and pneumatics, increasing production speed by 40% and saving $10,000 anually.
- Engaged in operations involving a Telematics Control Unit (TCU) assembly unit featuring 4 stations and 3 FANUC (CR-4iA) robots with R-30iB micro controller.
- Proficient in robot programming, path planning using Robo Guide and DeltaV with knowledge in KUKA integration, including I/O setup, interference zones, and PLC auto-debugging.

Robotic Process Automation Developer — Aug 2021 – Jan 2022
Accenture Baltics — *Riga, Latvia*

- Developed Invoice Processing and Order Management Automation using UiPath, reducing manual processing time by 70% and increasing efficiency . Managed RPA projects with on-time delivery rate, leveraging Azure and RE frameworks to cut errors by 85% and optimize processes.

Junior Automation Engineer — June 2019 – July 2021
SIA Automation Engineering — *Riga, Latvia*

- Assisted senior engineers in PLC (Siemens, Rockwell) and HMI programming for 3 projects, boosting efficiency by 30% and reducing downtime.
- Conducted system testing and troubleshooting resolving 95% of issues , and utilized SCADA/HMI (Ignition) for enhanced monitoring and control.

Technical Skills

Languages: Python, C/C++, .NET, JavaScript,PLC
Robotics Stack: ROS2, Gazebo, RViz, MATLAB, SLAM, State-Space control, PID Tuning, Tensorflow, RoboGuide, FANUC, KUKA, HMI, SCADA
Mechanical/Control Systems Stack: Solidworks, AutoCAD, Ansys, NX 12.0, Creo, RsLogix 5000, FEM, Modbus and LonWork networks protocols,ControlLogix, CNC, 3D printing, CMM, Laser-cutting, Welding techniques(TIG, MIG)
Software Development Stack: Git, Docker, Linux/Ubuntu, AWS in Robotics, CMake, Azure
Computer Vision stack: OpenCV, pandas, NumPy, Matplotlib,Machine Learning

Projects

ML Techniques for Adhesive Stress-Strain Forecasting | *XGBoost, FEA, ANSYS, DNN* May 2023

- Integrating an advanced machine learning model for stress prediction in mechanical components using finite element analysis (FEA) principles.
- Implemented synthetic data generation techniques to simulate 3-point pin model behavior under various loading conditions.
- Created a comprehensive input-output framework incorporating strain tensors, stress tensors, and spatial coordinates to capture complex stress-strain relationships.
- Achieved 95% reduction in computational time compared to traditional FEA software (e.g, ANSYS), while maintaining accuracy within 3% of full-scale simulations

KUKA Robot trajectory for rectangular shape placement | *MATLAB, OpenCV* Jan 2023 – May 2023

- Leveraged a high-precision PID-controlled motion for a 7-DOF KUKA robot arm, using computer vision for object manipulation and Aruco marker-based localization to achieve sub-millimeter placement accuracy with a robust inverse kinematics algorithm.
- Maximized system performance with OpenCV for image processing, a 100 Hz control loop, ensuring real-time adaptations while optimizing torque monitoring constraints using state-space control, ensuring stable dynamic responses under variable loads.
- Secured 99.7% reliability over 1000 test cycles, completing task within 10 seconds with an average placement error of ± 0.3 mm.

Optimal Electromechanical Design: High-Performance RC Plane | *Solidworks, Arduino* April 2017

- Built a balsa wood aircraft with a focus on electromechanical integration.Used design software such as Solidworks for structural analysis and 3D modeling to optimize aerodynamics and reduce weight, resulting in a 15% increase in flight time and 25% better maneuverability
- Executed a system with brushless DC motors, digital servos, a 2.4GHz receiver, and a LiPo battery, demonstrating circuit design and control system skills
- Conducted flight tests to refine control parameters and ensure conistent performance in various weather conditions..

Research Experience

Aerial Robot soaring motion analysis and control optimization | *Solidworks,ANSYS* Jan 2022

- Achieved 95% correlation with experimental data by developing high-fidelity computational models for robot soaring motion analysis, utilizing SOLIDWORKS for 3D kinematic simulations and MATHCAD for analytical formulations.
- Integrated multi-parameter flight dynamics, including trajectory geometries, force excitation profiles, and starting conditions; this led to a 25% increase in flight duration and a 30% boost in aerodynamic efficiency.
- Performed in-depth experimental studies to improve autonomous navigation capabilities for aerial robotics in dynamic atmospheric conditions by 50%. These investigations made use of advanced control systems theory and fluid dynamics principles.

Computational Modelling of Soft Robot for Medical Devices | *ANSYS,CFD* May 2021

- Designed an innovative soft robotic system for club foot (CTEV) treatment, utilizing hyperelastic material analysis and computational modeling. Achieved 30% improved efficacy, reduced discomfort for ages 1-4, and potentially 15-20% shorter treatment time.
- Applied Denavit-Hartenberg parametrization to 15+ foot bone structures, improving 3D modeling accuracy of deformities by 25%. Created an adaptive rehab assist shoe prototype with 35% increased corrective force and greater manipulation range.
- Fine-tuned 10+ hyperelastic models for material selection and optimized a comprehensive computational framework combining soft robotics, biomechanics, and material science.