SMRITHI S

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EXPERIENCE

Indian Space Research Organization (ISRO) Aug 2023 - present

Engineer

- Developed and demonstrated algorithm and software for **autonomously detecting and capturing free floating debris in zero gravity** using **eye-in-hand robotic arm system**. Project Flown as part of POEM 4 C60 Mission.
- Developed an **online reactive trajectory generation routine** minimising the interception time of the robotic arm to the debris at lesser computational cost.

Indian Institute of Technology, Mandi (IIT Mandi) Jul 2023 to Jul 2024

Research Intern. Advisor: Prof. Amit Shukla, Center for AI and Robotics

- Developed pose estimation algorithm using **template matching with chamfer distance** (RMS error in pose: 0.005 mm) and achieved contour-based size estimation accuracy within 0.36mm.
- Supported for evaluating advanced deep learning models on a custom bolt dataset, achieving the highest segmentation accuracy (mIoU: 0.95) with DeepLabV3+.

Cummins Ind PVT LTD Pune, India

Mechanical Test Ops and Lab Ops Engineer *Aug 2021 - May 2023*

- Successfully completed a 500-hour Cycle6 test on CPS B6.7 engines, achieving a **14.2 percent** cost saving (7.37L) and **99.3 %** data quality.
- Developed **uCheck tool and system health check** for test cell and engine health analysis. Increased data quality levels to **98.5 %**
- Certified as **ISO/IEC 17025:2017 Internal Auditor for Laboratory Management Systems**

EDUCATION

National Institute Of Technology Karnataka(NIT-K, Surathkal) *Aug 2017 - May 2021*

Bachelor of Technology, Department of Mechanical Engineering; ***CGPA: 7.3/10.0***

Relevant Coursework: Automatic Control Eng, Graph theory, Mechanics of Machines, Machine Dynamics and Vibration

PUBLICATIONS

Conference Papers

1. S. P. S. K*, A. Shukla and S. Smrithi*, "Automated Vision-Based Bolt Handling for Industrial Applications Using a Manipulator," 2024 12th International Conference on Control, Mechatronics and Automation (ICCMA), London, United Kingdom, 2024, pp. 193-198, doi: 10.1109/ICCMA63715.2024.10843915

ACADEMIC RESEARCH PROJECTS

Modelling and Simulation of Human Walking Towards Developing a Lower Limb Exoskeleton Aug 2020 - April 2021

Bachelor Thesis, Advisor Prof. K.R Guruprasad

- Designed a lower limb exoskeleton using 2R manipulators, modeling human gait in MATLAB SIMULINK.
- PID control achieved joint angles with error under 5 degrees in Simscape.

Inverse kinematics solution formulation using neural network Aug 2019 - Jan 2020

- Formulated loss function using inverse sinusoid activation with sigmoid to solve inverse kinematics problems and modelled in simulink. The results were tested on a 3-link 2 Degree of freedom planar robotic arm.

SKILLS

- **Languages**: Python, C, C++ **Platforms**: Linux, Nvidia Jetson, Arduino **Numerical Computing**: MATLAB AND SIMULINK
- **Libraries**: PyTorch, KDL Orocos **Tools**: Solidworks, Auto-Cad, Creo-Pro E, Ansys Suite, Comsol Multiphysics, Gazebo, ROS, Git

LEADERSHIP & EXTRACURRICULAR

- Vehicle Dynamics Head, Formula One Student team: Secured 7th place at Formula Bharat 2021.
- Taught English and Science subjects for 4th and 5th grade as a **Volunteer** at the KREC Kannada medium school.
- Taught Mathematics to tribal communities girls as **Volunteer** from Evidyaloka NGO.