

MUKIL SARAVANAN

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BRIEF BIOGRAPHY

Mukil Saravanan is an MSc Robotics (Honours) student at TU Delft, focusing on the **intersection of robotics, reinforcement learning, and control**. He is particularly interested in developing **general-purpose algorithms that enable autonomous systems to acquire complex behaviors**, adapt from experience, and operate robustly in uncertain and dynamic environments.

His background includes a tenure as a **graduate researcher** at the Indian Institute of Science (IISc, Bangalore) and multiple academic distinctions at the national level and top-tier international robotics competitions. He holds a **granted patent** and actively contributes as a **teaching assistant** and as a volunteer at robotics conferences.

EDUCATION

Master of Science in Robotics (with Honors)	Sep 2024 - Present
Delft University of Technology (TU Delft)	<i>Delft, Netherlands</i>
CGPA: 8.1/10.0 (until Quarter 6)	
Bachelor of Electronics and Communication Engineering	Aug 2018 - Jun 2022
Government College of Technology (Anna University)	<i>Coimbatore, India</i>
CGPA: 8.85/10.0 (First Class with Distinction)	

SKILLS

Technical Skills	Deep Learning, Deep Reinforcement Learning, Model Predictive Control Machine Perception
Soft Skills	Self-discipline, Work ethic, Leadership
Tools	<i>Frameworks & Libraries:</i> PyTorch, Tensorflow, Acados, CVXPY, OpenCV <i>Physics Engines:</i> Gazebo, PyBullet, MuJoCo <i>Robot Operating System:</i> ROS1, ROS2 <i>Programming Languages:</i> Python, C++, MATLAB, JAX <i>Embedded Devices:</i> STM32, Raspberry Pi, Arduino

RESEARCH EXPERIENCE

Research Assignment	Nov 2025 - Present
Cognitive Robotics(CoR), TU Delft	<i>Delft, Netherlands</i>
<ul style="list-style-type: none"> Investigating into learning temporally-coherent action chunks using Contrastive Policy Learning from Interactive Corrections with Zhaoting Li under the supervision of Prof Jens Kober This work explores how reward signals can be leveraged to improve policy stability, sample efficiency, and exploration in interactive reinforcement learning settings. 	
Honours Research	
Autonomous Multi-Robots Lab (AMR), TU Delft	
<ul style="list-style-type: none"> Jointly researching on whole body control of aerial robot manipulation with Dr. Sihao Sun under the supervision of Prof Javier Alonso-Mora This work investigates developing a task space planning for a 2-DoF aerial manipulator using Non-linear Model Predictive Control (NMPC), integrating the system's coupled contact kinodynamics. 	

Research Engineer	May 2023 - Mar 2024
Hindustan Aeronautics Limited (HAL)	<i>Bangalore, India</i>
<ul style="list-style-type: none"> Researched and developed a state-space model of a high-fidelity system and a control algorithm in association with HAL & IISc under the guidance of Mr. Hitesh Mohan Trivedi and Prof. Abhra Roy Chowdhury 	

- Researched on developing a novel Brain-Robot Interface to localize audio sources of assistive robots in industry 4.0 scenarios under the guidance of [Prof. Abhra Roy Chowdhury](#)
- Received **2 awards in prestigious IEEE ICRA, IROS 2022** competition. Published a first authored conference paper in AIR 2023. Filed an [Indian Patent](#).

- Awarded **the prestigious Indian Academy of Sciences (IAS) Summer Research Fellowship** to research under the principal research scientist [Dr. Rathna G N](#) at Digital Signal Processing lab.
- Focused on feature extraction methods of ECG signals to detect emotions for a trans-radial prosthetic arm. Adopted 4-level wavelet decomposition to extract a total of 18 temporal, spectral and non-linear Heart Rate Variability (HRV) features.

PATENT

Brain-computer interface-based Sound Source Localization for Attending tasks in an Industrial environment via Human-Robot Interaction - (Granted Indian Patent. Application Number: 202341087196): Embodiments of the disclosure relate to a Brain-Robot Interface framework using Auditory Steady State Response (ASSR) for audio-aware navigation of mobile robot in industrial environments  

PUBLICATIONS

Transforming Pixels into a Masterpiece: AI-Powered Art Restoration using a Novel Distributed Denoising CNN (DDCNN) - (Presented at - IEEE ICETCI 2023): The work presents a creation of diverse dataset of deteriorated art images with various degradation levels and a CNN-based approach to restore intricate details in the art 

Unlocking the Secrets of Gesture-based Communication: A Feature Extraction Technique for Accurate Recognition of Human Activities in Socially Assistive Scenarios - (Presented at - ACM AIR 2023): The work aims at the development of a reliable human gesture recognition system driven through spatio-temporal feature extraction of human pose using human pose estimator model 

PROJECTS

A Multi-Modal BEV Fusion and Affine Augmentation for 3D Object Detection: Developed BEVFusion-L, a late-fusion RGB–LiDAR architecture combining ResNet image semantics with voxelized LiDAR to mitigate sensor sparsity in autonomous driving. Achieved 77.74% mAP on the VoD dataset (+10.96% over CenterPoint), improving robustness for small and occluded objects, especially pedestrians and cyclists. *Project under Prof Holger Caesar, Advanced Machine Perception course* 

Intelligent Robotic Control: Physics-Informed Learning, Iterative Learning Control, and Gaussian Processes: Implemented data-driven control strategies by uses physics-informed modeling, and probabilistic methods to control robotic manipulators. *Project under Prof Cosimo Della Santina, Intelligent Control Systems course* 

Vision-Based Navigation on Resource-Constrained Micro Aerial Vehicle: Developed a lightweight CNN-based autonomous navigation framework for a Parrot Bebop 2 MAV using knowledge distillation and self-supervised monocular depth labeling. Achieved a 96% parameter reduction ($1.5M \rightarrow 48.8K$), 1.4 MB model size, and real-time onboard inference (11 FPS, 90 ms latency), with 86.63% accuracy and 0.9033 F1-score in dynamic obstacle avoidance. *Project under Prof Guido de Croon, Autonomous Flight of Micro Air Vehicles course* 

Disturbance-Robust MPC for Output Tracking of Underactuated Systems with Ellipsoidal Terminal Set: Designed an output-based Model Predictive Controller with disturbance rejection for a drone carrying tethered cargo. Ensured constraint satisfaction and asymptotic stability using an ellipsoidal terminal set. *Project under Prof Sergio Grammatico, Model Predictive Control course* 

Autonomous Apple Harvesting Robot: SLAM, Mobile Manipulation & Human-Robot Interaction: Designed and validated a low-cost autonomous apple-harvesting system using ROS 2, Visual-LiDAR-SLAM, and MPPI for robust navigation and dynamic obstacle avoidance in unstructured fields. 

Waypoint tracking controller of quadrotor: Developed and evaluated waypoint tracking controller for quadrotor using potential field constraints in Model Predictive Control. *Project under Prof Javier Alonso-Mora, Planning & Decision-Making* 

Other projects are found on the portfolio website 

TEACHING EXPERIENCE

Teaching Assistant - Intelligent Control Systems (RO47021)
Delft University of Technology (TU Delft)

Feb - Apr 2026
Delft, Netherlands

- Mentoring master's students in implementing Physics-Informed Learning (LNNs), Iterative Learning Control, and Gaussian Processes using JAX and PyTorch

Teaching Assistant (Lab Instructor) - Intelligent Mobile Robotics (MN 207)
Indian Institute of Science (IISc)

Fall 2022, Fall 2023
Bangalore, India

- Taught students the fundamentals of embedded systems and aided in embedded C programming.
- Developed and delivered hands-on lab sessions that allowed students to realize the concepts through Firebird V robots.

ACCOLADES

- Awarded [2nd prize](#) in NVIDIA Art Restoration Hackathon in IEEE ICETCI 2023
- Awarded [2nd prize](#) in HEART-MET Activity Recognition Challenge in **IROS 2022**
- Secured [9th position](#) in BARN Challenge 2022 in **ICRA 2022**
- Secured an overall [11th position](#) among 152 international teams in the team 'strawberry stacker' of E-Yantra Robotics Competition 2021 - 2022
- Selected for [Summer Research Fellowship Program \(SRFP\) 2021](#) by Indian Academy of Sciences (IAS) among over 40,000 applicants

PROFESSIONAL EXPERIENCE

Chairperson
GCT IEEE Student Branch

Sep 2021 - Nov 2022
Coimbatore, India

- Established and chaired the GCT IEEE Student Branch comprising 60+ members to foster a strong research culture in GCT. **Founded** the Robotics Club
- Conducted a 6-month intra-college AI hackathon with over 100 participants, hosted more than 20 seminar sessions, AI BootCamp, inter-college workshop on 'Wheeled Mobile Robotics' to 60+ undergraduate students in Tamilnadu and presented works on National Technology Day 2022, featured in IEEE Madras Section Newsletter.

OPEN-SOURCE TOOLS/DATASET

Art Image Distortion Dataset: Created a dataset encompassing a total of 85,1000 RGB images with 17,020 clear images and 50 distorted versions for each of these clear images 

ROS bag plotter MATLAB: A tool to visualize ROS bag signals in MATLAB. 

OUTREACHES

- **Student Volunteer** at multiple robotics conferences including IEEE RO-MAN 2025, IEEE ICRA@40 2024 
- **Facilitator** in a two-day hands-on workshop on 'Robot Operating System (ROS1)' to over 40 students, organized by BMSCE IEEE PES and Sensors Council, Bangalore in 2024
- **Facilitator** in a workshop in 'IEEE International Conference for Women in Innovation, Technology & Entrepreneurship' to 40+ multi-disciplinary students and industrialists on Cobotics: Perception, Planning & Controls in 2022
- **Facilitator** in the workshop 'Introduction to Wheeled Mobile Robotics' to 60+ undergraduate students from all around Tamilnadu in GCT 2022

LEADERSHIP ACTIVITIES

- **Mentored students** at Cognitive Robotics Department (2025), Introduction Programme (2025, 2026) at TU Delft, Robotics Society in GCT IEEE Student Branch (2021 - 2022)
- **Technical lead** at numerous occasions – group projects (Idea to Start up - Deep Tech) & competitions {E-Yantra Robotics Contest (2021-2022), E-Yantra Innovation Contest (2020)}