

# MUKIL SARAVANAN

+31 6 22613989 ◇ Delft, Netherlands

[mukilsaravanan@tudelft.nl](mailto:mukilsaravanan@tudelft.nl) ◇ [LinkedIn](#) ◇ [mukilsaravanan.github.io](https://mukilsaravanan.github.io)

## 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

<b>Master of Science in Robotics (with Honors)</b> <a href="#">Delft University of Technology (TU Delft)</a> <b>CGPA:</b> 8.1/10.0 (until Quarter 6)	Sep 2024 - Present <i>Delft, Netherlands</i>
--	---

<b>Bachelor of Electronics and Communication Engineering</b> <a href="#">Government College of Technology (Anna University)</a> <b>CGPA:</b> 8.85/10.0 ( <b>First Class with Distinction</b> )	Aug 2018 - Jun 2022 <i>Coimbatore, India</i>
--	---

## SKILLS

<b>Technical Skills</b>	Deep Learning, Deep Reinforcement Learning, Model Predictive Control Machine Perception
<b>Soft Skills</b>	Self-discipline, Work ethic, Leadership
<b>Tools</b>	<i>Frameworks &amp; 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

<b>Research Assignment</b> <a href="#">Cognitive Robotics(CoR)</a> , TU Delft	Nov 2025 - Present <i>Delft, Netherlands</i>
--	---

- 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.

<b>Honours Research</b> <a href="#">Autonomous Multi-Robots Lab (AMR)</a> , TU Delft	Mar 2025 - Present <i>Delft, Netherlands</i>
---	---

- 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.



<b>Research Engineer</b> <a href="#">Hindustan Aeronautics Limited (HAL)</a>	May 2023 - Mar 2024 <i>Bangalore, India</i>
---	--

- 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)**

Feb - Apr 2026

[Delft University of Technology \(TU Delft\)](#)

*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)**

Fall 2022, Fall 2023

[Indian Institute of Science \(IISc\)](#)

*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**

Sep 2021 - Nov 2022

[GCT IEEE Student Branch](#)

*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)}