

MUKIL SARAVANAN

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EDUCATION

Bachelor of Electronics and Communication Engineering Government College of Technology (Anna University) CGPA: 8.85/10.0 (First Class with Distinction)	Aug 2018 - Jun 2022 <i>Coimbatore, India</i>
Higher Secondary School Certificate (Class 12) Sri Lathangi Vidhya Mandir Higher Secondary School Percentage: 97.4 %	Jun 2017 - Apr 2018 <i>Pollachi, India</i>
Secondary School Leaving Certificate (Class 10) Venkitaraj Matriculation School Percentage: 96.4 %	Jun 2015 - Apr 2016 <i>Sultanpet, India</i>

SKILLS

Technical Skills	Control System Design, Computer Vision, Machine Learning, Digital Signal Processing
Soft Skills	Self-discipline, Work ethic, Leadership
Tools	Robot Operating System (ROS), MATLAB, Embedded Devices (Arduino, Raspberry Pi, STM32), C++, Python, Linux, OpenCV, MNE Python

RESEARCH EXPERIENCE

Research Engineer A prominent Indian Defence Company	May 2023 - Present
<ul style="list-style-type: none"> Researching on state-space modelling and controlling of a system with a prominent defence company of India under the guidance of Prof. Abhra Roy Chowdhury 	
Graduate Researcher Indian Institute of Science	Mar 2022 - Present <i>Bangalore, India</i>
<ul style="list-style-type: none"> Researching under the guidance of Prof. Abhra Roy Chowdhury on developing a novel Brain-Robot Interface to localize audio sources of assistive robots in industry 4.0 scenarios. Received 2 awards in prestigious IEEE ICRA, IROS 2022 competition. Published a first authored conference paper in AIR 2023. Filed an Indian Patent. 	
Summer Research Fellow Indian Institute of Science	Jul 2021 - Oct 2021 <i>Bangalore, India</i>
<ul style="list-style-type: none"> 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. 	

TEACHING EXPERIENCE

Teaching Assistant - Intelligent Mobile Robotics (MN 207) Indian Institute of Science	Fall 2022, Fall 2023 <i>Bangalore, India</i>
<ul style="list-style-type: none"> 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. 	

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.

Summer Intern

TCS iON

Jun 2020 - Jul 2020

Remote

- Designed a Robot Process Automation (RPA) bot solution to download email attachments and automate data entry into a web form.
- Compared and utilized web scrapping tools such as UiPath and Selenium to automate the workflow.

PATENT

Brain-computer interface-based Sound Source Localization for Attending tasks in an Industrial environment via Human-Robot Interaction - (Indian Patent Filed. 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.

Advancing Assistive Robotics: Enhancing Robot Navigation through Activity Recognition - (Poster Accepted at - IEEE IROS 2023): The research focuses on enhancing assistive robot technology through activity-based communication and robot navigation in Human Robot Interaction scenarios.

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.

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
- [Top 4 finalist](#) in men's category from colleges of India and Sri Lanka in Synopsys Inno Champ 2020 for the innovative idea to prevent COVID-19.
- Awarded 2nd place in district level inter school science exhibition (senior category) for making Piezo electric shoe.

PROJECTS

Benchmark Autonomous Robot Navigation Challenge: Developed a navigation algorithm to manoeuvre a non-holonomic mobile robot in 300 increasing levels of highly cluttered obstacle configurations. [You Tube](#)

Strawberry Stacker: Minimized delivery time and flying cost of a multi-drone system to pick strawberry boxes from a field and stack them onto a transport trailer. [🔗](#)

Indoor Obstacles detection model: Built a deep learning-based object detection model for detecting indoor obstacles from a cleaning robot's point of view. Boosted the baseline inference speed by 50% [🔗](#)

Feature Extraction of ECG Signal for Emotion Detection: Extracted a total of 18 features in temporal, spectral and non-linear domain of ECG signals for unimodal emotion detection. [🔗](#)

Industrial Mobile Manipulation Challenge: Solved a pick and place operation of a wheeled mobile robot in an industrial setup. [🔗](#)

Automatic UV-C Sanitizer for Grab Handles: Proposed a model to prevent the spread of infection via the commonly touched surface by automating the sanitization process using Far UV-C radiation. [📄](#)

Smart Switch: IoT-based home automation: Developed a solution to automate household switches using a timer-based socket breaking system. [You Tube](#)

Dual Powered Multi-purpose Emergency Kit with HAM Radio Receiver: Developed a solar and hand-crank powered multiplexer-based 144 MHz HAM radio receiver. [You Tube](#)

OPEN-SOURCE TOOLS/DATASET

Art Image Distortion Dataset: An RGB Image Dataset encompassing a total of 85,1000 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. [🔗](#)

Arduino library for Ultrasonic Sensor (HC-SR04): An Arduino library to compute proximity information for HC-SR04 [🔗](#)

CO-CURRICULAR & LEADERSHIP ACTIVITIES

- **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
- **Facilitator** in the workshop 'Introduction to Wheeled Mobile Robotics' to 60+ undergraduate students from all around Tamilnadu in GCT 2022
- Mentored a team of 10 members at Robotics Society in GCT IEEE Student Branch
- Led a team of 4 members in E-Yantra Robotics Contest (eYRC) 2021-2022.
- Led a team of 4 members in E-Yantra Innovation Contest (eYIC) 2020

PROFESSIONAL AFFILIATIONS

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| • Student Branch Advisor at GCT IEEE Student Branch | Nov 2022 - Present |
| • Team Lead at GCT Robotics Society | Dec 2021 - Oct 2022 |
| • Student Member in IEEE, IEEE Robotics and Automation Society (RAS) | Mar 2021 - Dec 2022 |