SIDHARTH PADMANABHAN

+91 8547289096 | sidharthpadman9@gmail.com | linkedin.com/in/sid-wc121 | sid-wc121.github.io

EDUCATION

Amrita Vishwa Vidyapeetham   Amritapuri, Kerala, India
B.TECH. ELECTRONICS AND COMPUTER ENGINEERING   2021 – 2025
- Relevant Courses: Data structures & algorithms, Calculus, Data Science, Deep Learning, Computer Networks
- CGPA: 7.95/10

PROFESSIONAL EXPERIENCE

Singapore University of Technology and Design (SUTD)   Singapore
RESEARCH INTERN - ROBOTICS   Feb 2024– Apr 2024 | Onsite
- Tested and helped re-implement Smorphi educational robot curriculum designed by the SUTD research team
- Assisted in inventory management and quality control at Wefaa Robotics (15 robots), a startup spin-off from SUTD
- Led the development of a Smorphi-based cleaning robot, focusing on LiDAR mapping, navigation, and coverage optimization
- Worked on navigation backbone that allowed seamless integration of sensor controls, resulting in ∼30% faster performance

HuT Labs   Kerala, India
RESEARCH INTERN - MACHINE LEARNING   Aug 2023 – Feb 2024 | Onsite
- Re-implemented ML components from multiple research papers including using SVM to fuse MobileNet SSD and MobileNetv2 outputs for staircase detection in "sTetro" robot project
- Collected, processed, and labelled data (9500+ samples) to train and evaluate models for staircase detection
- Developed a custom deep CNN model with 23% improvement in staircase detection over other benchmarked models

Team bi0s   Kerala, India
FULLSTACK DEVELOPER   Oct 2022 – Jan 2023 | Hybrid
- Collaborated with cross-functional teams to design and develop a CMS (Content Management System) website
- Implemented responsive web pages and multi-tier user login using Vite-React.js, Redux, and Tailwind CSS
- Gained agile development experience through sprint planning and stand-up meetings

PUBLICATIONS   (Google Scholar)⚲

- **Sidharth P**, Sukrith Sunil, Poorna S S, Anuraj K. (2025) "Cepstral Graph GCN: An Efficient Approach to Parkinson's Disease Detection Using Graph Neural Networks". In: **Final Editing** .
- Manikandan Arunachalam, **Sidharth P**, Sooraj Nair, Nikhil Rajiv, Rakesh Suresh Babu. (2025) "Blockchain Approach for Real-Time Authentication in 6G Machine-to-Machine Communication". In: **IGI Global**. Book: **6G Networks and AI-Driven Cybersecurity**, Shaikh, Riaz Ahmed. (Link) ⚲
- **Sidharth P**, Dr. Rajesh Kannan Megalingam. (2024) "Custom Deep CNN-Based Staircase Classification for Smart Environments". In: **ICONAT 2024**.(Link) ⚲
- Sreedutt Ram J, **Sidharth P**, Sukrith Sunil, Poorna S S, Anuraj K. (2024) "Comparative Analysis of DL Models Using Cough Audio Data for Early Detection of COVID-19". In: **ICCIDA 2024** .(Link) ⚲
- Manikandan Arunachalam, **Sidharth P**, Sooraj Nair, Nikhil Rajiv, Rakesh Suresh Babu, Sanjay T. (2024) "Blockchain-based IoT Computing Services in Medical Healthcare Solutions - a thorough review". In: **IGI Global**. Book: **Blockchain-Based Solutions for Accessibility in Smart Cities**, Kumar Abhishek, Chinmay Chakraborty. (Link) ⚲

PROJECTS   (GitHub)⚲

Few-Shot Audio Classification for Respiratory Disease Detection   July 2025 – Present
*In collaboration with **Dr. Hyeonuk Nam**, **KIAST University***
- Currently conducting literature review on few-shot learning approaches for audio-based respiratory disease detection.
- Exploring datasets and meta-learning frameworks tailored for low-resource medical audio scenarios.
- Project aims to enhance detection of respiratory diseases from limited cough data using few-shot audio classification.

Medical Image Anomaly Detection and Classification | *PyTorch*   Mar 2025 – June 2025
- Curated a unified dataset combining Brain MRI, Chest X-ray, and Liver CT images for anomaly detection and classification.
- Used ResNet-50 (Blocks 2 & 3) for feature extraction in an autoencoder-based adversarial network setup.

- Achieved clear anomaly separation on brain and lung data; liver CT showed moderate separation.
- Reached 87% classification accuracy across brain, lung, and liver disease classes.

Graph Convolutional Neural Network for Chest X-ray Classification | *PyTorch*   Jan 2025 – Mar 2025
- Developed a GCN model for classifying pneumonia and COVID-19 from chest X-rays, achieving 92.38% accuracy.
- Outperformed ResNet-50 by 8% with 100x fewer parameters, though requiring 2x training time.
- Enhanced model interpretability by leveraging graph-based spatial relationships in medical imaging.
- Currently adapting the method for brain tumor detection.

Biomarker Identification for Diabetic Nephropathy | *sklearn, TensorFlow*   Oct 2024 – Nov 2024
- Trained autoencoders with 250 perceptrons in the intermediary layer and 21 in the bottleneck layer.
- Generated heatmaps for raw data, intermediate, and bottleneck layers to analyze encoding.
- Selected 30 unique genes using a 0.7 threshold on normalized cumulative counts.
- Applied RFE with SVM as the base classifier to reduce to 19 genes, achieving the best classification accuracy.

Sound Generation and 3D Visualization with Neural Networks | *Python, TensorFlow*   Mar 2024 – June 2024
- Developed models using RNN, Autoencoder, and LNN for generating music samples, with Autoencoder giving the best results.
- Used deep autoencoders to represent audio (music) as trajectories in a low-dimensional embedding space.
- Implemented an end-to-end architecture with a recurrent module to predict the next point in the trajectory.
- Visualized and compared trajectories of original and generated samples to identify the closely matched patterns.

HFCC Feature Extraction Package | *Python*   Dec 2023 – Jan 2024
- Developed a comprehensive HFCC (Human Factor Cepstral Coefficients) feature extraction package to support the research presented in the paper *"Comparative Analysis of DL Models Using Cough Audio Data for Early Detection of COVID-19"* at ICCIDA.
- Designed the package to be fully customizable, allowing users to adjust each parameter according to specific requirements.

Languages

Malayalam Mother tongue; **English** Fluent; **Hindi** Basic; **Tamil** Basic

Technical Skills

Programming: Python(proficient), R(proficient), C(intermediate), JavaScript(intermediate), Matlab(intermediate)
Frameworks: Tensorflow(proficient), PyTorch(proficient), React.js(advanced), Next.js(advanced), Node.js(intermediate)

Positions of Responsibility

IEEE RAS Chair at Student Branch, Amrita Vishwa Vidyapeetham   Apr 2024 – Jan 2025
- Sharing information about funded projects in collaboration with IEEE, and providing learning resources
- Organizing robotics-related talks and workshops, fostering student engagement in robotics and ML

Lead Colorist, Media Amritapuri (now B Rollers)   Oct 2023 – Mar 2025
- Responsible for color correction and enhancement of media content, ensuring high-quality visual output.Collaborated with creative teams to achieve visual excellence in images.

Executive committee member, Vidyut (campus multi-fest)   Dec 2023 – Apr 2025
- Responsible for photography, videography quality maintenance, managing junior colorist team and recruiting new members.

Extra-Curricular Activities

SSR Project⌗ - Hosted a 3 day Technical workshop to impart knowledge and skill to college students on Cyber Security, Microcontrollers (Arduino), C programming, Version Control Systems (Git/Github) and Conducted a coding contest for them as part of Student's Social Responsibility (SSR) initiative.

Community Services - AmritaSREE Kit Distribution Seva⌗ - Engaged in community service by participating in the AmritaSREE Self Help Groups organised by Mata Amritanandamyi Math on 24th December 2022 at Cherthala