Tharusha Sehan

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ABOUT ME

Research driven graduate specializing with an international R&D background at Robert Bosch GmbH. Expert in the evaluation and characterization of MEMS inertial sensors, with a focus on semiconductor device performance and hardware-driven system design. Proven track record in bridging Digital Signal Processing with physical sensor hardware, utilizing advanced diagnostics to optimize micro-system interfaces and measurement accuracy.

EDUCATION AND TRAINING

BSc (Hons) in Electronic and Telecommunication Engineering

General Sir John Kotelawala Defence University [09/08/2021 – 01/07/2025]

City: Colombo | **Website:** https://kdu.ac.lk/ | **Field(s) of study:** Electronic & Telecommunication Engineering |
Thesis: Enhanced elephant detection system through vibration analysis and underground sensor deployment (Final grade - A)

WORK EXPERIENCE

🏢 *Robert Bosch GmbH - Intertial Sensors (MEMS) Engineering Department* – Reutlingen, Germany

Electronic Engineer (Fixed Term Contract)

[01/04/2025 – 30/09/2025]

- Optimized the performance of BMI560 motion sensors by developing and validating a specialized hardware testbed for micro-mechanical evaluation
- Conducted high-precision experiments using a Vector Network Analyzer (VNA) to characterize circuit impedance and optimize interfaces for micro-scale sensors.
- Assisted in MEMS sensor calibration and evaluation for devices requiring humidity sensitivity, designing and validating an improved test setup.
- Collaborated with senior R&D engineers to analyze sensor data utilizing nanodiagnostic principles to improve measurement accuracy and device performance metrics.
- Gained comprehensive experience in semiconductor interfacing signal analysis, and the evaluation of complex micro-systems within a professional German R&D environment.
- Developed and validated microcontroller-based prototypes to automate the performance testing of MEMS sensors significantly improving data reliability and streamlining the micro-fabrication evaluation process

🏢 *University of Bremen* – Bremen, Germany

Research Associate

[07/08/2024 – 10/10/2024]

- Developed an elephant detection system using vibration analysis and subterranean sensors to monitor elephant movement patterns.
- Applied Fourier series and time-series modeling to analyze sensor data and identify movement signatures.
- Designed and implemented machine learning models including CNNs and LSTMs to improve detection accuracy.
- Integrated LoRa communication for wireless data transmission from remote sensors.
- Applied Digital Signal Processing (DSP) techniques and Exploratory Data Analysis (EDA) to process and interpret environmental signals.

- Deployed machine learning models on edge devices using TFLite, optimizing real-time detection.
- Developed and tested systems on microcontrollers and boards: Portenta H7, Raspberry Pi, Heltec ESP32 V2.

🏢 *Vega Innovations (South Asia's First Electric Supercar Manufacturer)* – Colombo, Sri Lanka

Electronic Engineering Intern

[16/10/2023 – 29/03/2024]

- Worked with the CAN communication protocol to optimize Electronic Control Unit (ECU) performance in the company's flagship electric vehicle (EV), minimizing noise and latency in data transmission.
- Designed and enhanced the Electric Vehicle Charging Controller (EVCC) for improved efficiency and communication reliability within the EV system.
- Developed IoT-based solutions for a wireless key tag system for electric motorcycles, integrating microcontroller and RF technologies.
- Conducted RF research and testing to improve battery health monitoring and signal integrity in EV communication circuits.
- Collaborated with multidisciplinary engineering teams on embedded hardware design, testing, and validation processes.

HONOURS AND AWARDS

[09/08/2023] General Sir John Kotelawala Defence University
Research Publications
Nominated as the best research paper from the Faculty of Engineering at KDU International Research Conference 2023.Developed a wearable embedded system utilizing flex sensors and an IMU to translate hand gestures into real-time voice commands for silent military communication. The project focused on hardware-driven design, implementing signal processing algorithms on a microcontroller to ensure high-accuracy gesture recognition and reliable data transmission via low-latency serial communication protocols

PROJECTS

[03/01/2024 – 15/12/2024]
Elephant Detection and tracking System through Vibration Analysis and underground Sensor Deployment
Led my final year collaborative research team with the University of Bremen to develop an elephant detection system using subterranean sensors and vibration analysis. The project involved applying Fourier series and Digital Signal Processing to identify movement patterns, deploying CNN and LSTM models via TFLite onto Portenta H7 and Raspberry Pi for real-time edge detection. Integrated LoRa communication for wireless data transmission to mitigate human-elephant conflict in remote environments

[04/01/2024 – 03/04/2024]
Gesture Controlled Glove for a Military Team's Communication
Developed a wearable embedded system for silent military communication using an Arduino Nano (ATmega 328P) to translate hand gestures from flex sensors into voice commands. The project involved implementing signal processing for gesture recognition and utilizing serial communication via the HC-05 Bluetooth module to enable low-latency, non-verbal interaction between teammates in stealth environments.

SKILLS

Technical Skills

LoRa / C / C++ / MQTT / Python / DSP / CAN Protocol / BLE / Sensor Calibration, Trimming & Integration / PCB design / EDA Tools / MATLAB / IoT system integration / Fourier & Time Series Analysis / RF Engineering

Soft Skills

Leadership / Project Coordination / Public Speaking / Teamwork