

# Tilan

## Wickramarachchi

## Mechatronics Engineer

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### PROFILE

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Innovative mechatronics engineer with 3 years of experience in embedded systems, software development, and robotics. Passionate about automation, hardware design, and full-stack development. Seeking impactful solutions in embedded systems.

### TECHNICAL SKILLS

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<b>Software Development</b>	C/C++, Python, MATLAB, Java, ROS, Git, Linux.
<b>Tool Kits</b>	SOLIDWORKS, Altium, Proteus, EasyEDA, Simplify 3D.
<b>Embedded Devices</b>	Atmel, Espressif, ARM, Raspberry Pi.
<b>Sensors</b>	Lidar, Encoders, Ultrasonic.
<b>Communication</b>	I2C, SPI, UART, Wi-Fi Beaconing, DSRC.
<b>Hands-On Skills</b>	PCB Design, Prototyping and Assembly, Glass and Carbon fibre Manufacturing, Rapid Prototyping.

### PROFESSIONAL EXPERIENCE

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**Researcher**, *World Bank AHEAD Project, University Of Moratuwa, Sri Lanka*

*September 2019 to July 2022*

Multidisciplinary project funded by the World Bank. Focused on developing Intelligent Transportation Systems solutions and applications.

- Developed Intelligent Transportation Systems (ITS) solutions using embedded programming, wired/wireless communication, component sourcing, and research contributions, including patents and publications.

**Electronics Engineering Consultant**, *Dialog Axiata (Pvt) Ltd, Sri Lanka*

*September 2019 to July 2022*

The R&D wing of Dialog PVT LTD situated within the University. Focuses on developing hardware and software solutions for specific industrial clients.

- Developed hardware and software solutions for industrial clients, contributing to robotics projects, SNMP-based hardware health monitoring, and software and hardware architecture design using Python, Linux, and ROS.

**Freelance Electronics Product Designer**, *Self-employed, Sri Lanka*

*September 2019 to July 2022*

- Designed and developed consumer electronics, IoT devices, and industrial products for clients like Dankotuwa Porcelain, Dialog Axiata, and ACCEL.R. Expertise in CAD (SolidWorks), PCB design (Altium), prototyping, and DFM. Created smart devices, autonomous robots, and LiDAR-based systems, ensuring scalability and production efficiency.

**Software Engineer**, *Codegen International PVT LTD, Sri Lanka*

*February 2019 to September 2019*

Software development company in the Travel and tourism domain.

- Develop, test, and optimize Java-based “Travel Box” software per client requirements, contributing to the development of a proprietary travel and tourism engine test platform.

## **Undergraduate Intern, Future Drones (Pvt) Ltd, Sri Lanka**

June 2017 to December 2017

Startup UAV manufacturer and UAV-based service provider.

- Designed, prototyped, and operated fixed-wing, quadrotor, and hexa-rotor UAVs, conducted aerial mapping with Pix4D, and trained in UAV piloting.

## **EDUCATION**

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### **Master Of Engineering in Mechatronics Engineering (Coursework)**

University of Wollongong, 2024

Studied project management, product design, Australian standards and robotics.

### **Bachelor Of Science (Hons) In Electronic and Telecommunication Engineering**

University of Moratuwa, Sri Lanka, 2019 | 3.13/4.2

Focused on electronic hardware design, product design and manufacturing and robotics. Participated in and achieved high ranks in national mobile robotics competitions.

## **PUBLICATIONS**

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- **"Evaluation of DSRC/Wi-Fi Hybrid Communications for Intelligent Transport Systems,"** 2022 IEEE 25th International Conference on Intelligent Transportation Systems (ITSC), 2022, pp. 3509-3514, doi:10.1109/ITSC55140.2022.9922307.
- **"Active Road Signs: Enhancing Road Safety with Cost-Effective Wireless Technologies"**, Engineer: Journal of the Institution of Engineers, Sri Lanka, 2022 (Accepted).
- **"Enhancing Road Safety with Cost-Effective Wireless Technologies"**, Transport Research Forum, Department of Civil Engineering, University of Moratuwa, 2021(Abstract) pp. 21-22.
- **"Enabling ITS Applications with Affordable Communication Technologies"**, Transport Research Forum, Department of Civil Engineering, University of Moratuwa, 2020, pp. 20-21 (Abstract).
- **"Development of a Lightweight, Low-cost, Self-balancing Personal Mobility Vehicle for Autonomous Indoor Navigation"**, 2019 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), 2019, pp. 571-576, DOI: 10.1109/AIM.2019.8868788.
- **"Real-time warning system for pedestrians, vehicles, residences, and commercial entities proximate to a railway track"**. 21161, filed 12/02/2020.

## **CERTIFICATIONS**

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- Institute of Engineers, Sri Lanka: Associate Member (AM-27651).
- Engineers Australia: Professional member (10626525).

## **PROJECTS**

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### **M. Eng Final Project: Robot Path Planning for High-Accuracy Welding Applications: Using HoloLens 2**

University of Wollongong // 2024

Supervision: Dr. Philip Commins | Dr. Stephen Van Duin

Simplifying welding robot programming by utilising HoloLens's Time-of-Flight sensors to create a point cloud to detect and select weld seams.

### **BioStove**

2022

Designed an eco-friendly stove that utilizes domestic food waste to generate biogas and uses it to power the stove. The design was a part of a university assignment that included the electronics, the mechanical design and a business plan.

## **Smart Hydroponic GrowBox**

**2021**

Designed and developed a greenhouse for growing herbs and day-to-day vegetables using hydroponics. Electronics control lighting, humidity, temperature, liquid flow and chemical levels in the liquid. Utilizes temperature, humidity, flow rate, EC and pH sensors.

## **AHEAD Project Component: Experimental Evaluation of DSRC/Wi-Fi Hybrid Systems in Intelligent Transportation Systems.**

*University of Moratuwa // 2020*

*Supervision: Prof. Dileeka Dias | Dr. T.N. Samarasinghe*

Developed a DSRC/Wi-Fi hybrid communication to be used in Intelligent Transportation System (ITS) applications. Targeting to reduce the use of DSRC components and reduce the cost of deployment of ITS applications.

## **Thermal Scanner**

**2020**

Designed and prototyped a wall mount thermal scanner using an infrared thermal imager array and a Raspberry Pi to be mounted in office entrances as a measure to control the Covid-19 spread. Developed the software and hardware for the sensor and the final enclosure for the product.

## **Smart Bottle**

**2019**

Designed and prototyped a smart water bottle for a Sri Lankan porcelain company. Design was the bottle cap that houses a solar panel, LED ring light, USB charging, sonar sensor and a single button. The ring light is used to notify the user to consume the liquid. The consumed amount is recorded and can be downloaded to a computer.

## **B. Sc Final Project: Autonomous, Two-Wheeled, Self-Balancing Personal Mobility Device**

*University of Moratuwa // 2018*

*Supervision: Dr. Peshala G. Jayasekara*

Designed and developed a two-wheeled self-balancing personal mobility platform that can navigate obstacles in a predefined indoor environment using a lidar and RGBD sensor.

## **IESL Robogames 2017, IESL, Sri Lanka | Runners-up**

Designed and developed a robot that travels uneven terrain, following a black line and picking up and unloading a payload. (<https://youtu.be/GWvQK7Qm4pw>).

## **SLIIT Robofest 2017, SLIIT, Sri Lanka | 2<sup>nd</sup> Runners-up**

Designed and developed a robot that navigates a maze, picks up a payload, senses its colour, follows coloured arrows matching the colour of the box, and unloads the payload.

## **Sri Lankan Robotics Challenge 2017, University of Moratuwa, Sri Lanka | Finalist**

Designed and developed two robots. One of which was controlled using a remote controller to travel on uneven terrain, pick up a box and place it in a hole in the ground to complete the path for the second robot. The second robot solves a grid maze, picks up and unloads a payload.

*References are available upon request*