

# Mahela Pandukabhaya

MPhil (Reading), BScEng (Hons.), (s)MIEEE, AEng, AMIESL

## Temporary Lecturer

Department of Electrical and Electronic Engineering,  
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## RESEARCH INTERESTS

### Signal Processing

Sensors

### Control Theory

Instrumentation

### Biomedical Engineering

Electronics

### Artificial Intelligence

Acoustics

## EDUCATION

### MPhil in Electrical and Electronic Engineering (Reading)

[Faculty of Engineering, University of Peradeniya.](#)

Proposed Thesis: Wearable-based Human Motion Analysis: Sensor Instrumentation and Biomechanical  
Modelling for Performance and Psychomotor Skill Assessment

Sep 2025 - Present

Peradeniya, Sri Lanka

### BScEng (Hons.) in Electrical and Electronic Engineering

[Faculty of Engineering, University of Peradeniya.](#)

GPA: 3.80/4.00 (95%) (First Class Honours)

Research Project: Hand Gesture Recognition and Gait Analysis via Wearable Devices

Nov 2018 - Dec 2023

Peradeniya, Sri Lanka

### Primary and Secondary Education

[Trinity College, Kandy.](#)

G.C.E. Advanced Level in Physical Sciences (University Entrance Examination)

Jan 2003 - Sep 2017

Kandy, Sri Lanka

Aug 2017

## PUBLICATIONS

### Peer-Reviewed Journals

- [J<sub>1</sub>] **Performance Benchmarking of Psychomotor Skills Using Wearable Devices: An Application in Sport.** 2025 Feb
- VKM Pandukabhaya, TD Fonseka, RGMS Kulathunge, GMRI Godaliyadda, MPB Ekanayake, CD Senanayake, HMVR Herath.
  - In *IEEE Access*.
  - DOI: [10.1109/ACCESS.2025.3536837](https://doi.org/10.1109/ACCESS.2025.3536837)

### International Conferences

- [C<sub>4</sub>] **LSTM based Model for Weather-based Solar Irradiance Prediction for Long-Term PV Energy Planning.** 2025 Dec
- AS Bandara, VKM Pandukabhaya, RMKL Ratnayake, GMRI Godaliyadda, MPB Ekanayake, JB Ekanayake.
  - In *IEEE 19<sup>th</sup> International Conference on Industrial and Information Systems (ICIIS) 2025*.
  - **Accepted for Publication.**
- [C<sub>3</sub>] **Estimation of Angle of Significance in Human Joint Angles Using Kalman Filter and Principal Component Analysis.** 2025 Dec
- VKM Pandukabhaya, NT Meghapathirana, RMUO Ratnayake, GMRI Godaliyadda, MPB Ekanayake, HMVR Herath.
  - In *IEEE 19<sup>th</sup> International Conference on Industrial and Information Systems (ICIIS) 2025*.
  - **Accepted for Publication.**
- [C<sub>2</sub>] **Comparison of Appliance Signature Classification Methods for Non-Intrusive Load Monitoring.** 2024 Dec
- RMKL Ratnayake, VKM Pandukabhaya, DMUP Sumanasekara, RMUM Ratnayake, GMRI Godaliyadda, MPB Ekanayake, JB Ekanayake, HMVR Herath.
  - In *IEEE 4<sup>th</sup> Moratuwa Electrical Engineering Conference (EECon) 2024*.
  - DOI: [10.1109/EECon64470.2024.10841878](https://doi.org/10.1109/EECon64470.2024.10841878)

- *VKM Pandukabhaya, TD Fonseka, RGMS Kulathunge, GMRI Godaliyadda, MPB Ekanayake, CD Senanayake, P Gamage, HMVR Herath.*
- In *IEEE 10<sup>th</sup> Moratuwa Engineering Research Conference (MERCon) 2024.*
- DOI: [10.1109/mercon63886.2024.10689188](https://doi.org/10.1109/mercon63886.2024.10689188)
- **Best Paper Award** (Technology Management Track), Presenting Author.

## PATENTS

- **National Patent (Sri Lanka) LK/P/122798 (Pending): “A multi-sensory fetal movement analysing device” (2023).**  
Owners: GMRI Godaliyadda, MPB Ekanayake, JV Wijayakulasooriya, RMCJ Rathnayake, UH Delay, JB Senanayake, RT Nanayakkara, DMPM Alwis, LBIP Thilakasiri, VKM Pandukabhaya.

## RESEARCH EXPERIENCE

### *Postgraduate Research - Biomedical Engineering*

- **Miniaturization of Wearable Devices.** 2024 - Present
  - Miniaturization of an IMU-based full-body wireless wearable device
- **Assessment of Psychomotor Skills.** 2023 - Present
  - Exploration of algorithms for the quantitative assessment of psychomotor skills based on wearable devices.
- **Hand Gesture Recognition and Gait Analysis via Wearable Devices.** 2022 - 2023
  - Undergraduate Capstone Project
  - Development of an IMU-based full-body wireless wearable device to capture human body motion
  - Hand gesture classification via binary classification techniques
  - Gait parameter extraction for medical applications through joint kinematics obtained via extended Kalman filtering-based sensor fusion
  - Exploration of grading methods for the quantitative performance evaluation of physical tasks
- **Fetal Movement and Maternal Respiratory Pattern Monitoring.** 2021 - 2023
  - A collaborative research project with Department of Obstetrics and Gynaecology, Faculty of Medicine, University of Peradeniya, Sri Lanka focusing on the applications related to fetal condition monitoring using IMU-based wearable devices
  - Development of an IMU-based wearable device to monitor maternal abdomen movement for fetal condition evaluation
  - [National Patent \(Sri Lanka\) LK/P/122798 \(pending\)](#)

### *Postgraduate Research - Power and Energy Systems*

- **Real-time Power Inertia and Grid Impedance Monitoring.** 2025 - Present
  - Exploration of signal processing and machine learning algorithms for real-time power inertia and grid impedance monitoring
- **Non-Intrusive Load Monitoring (NILM).** 2024 - 2025
  - Exploration of algorithms for event detection, classification of appliance signatures, and unmixing aggregate power to determine the states of appliances and energy drawn

### *Undergraduate Mini-Projects*

- **CalcWizard. (UG)** 2022 - 2023
  - Development of an RTL-based learning aid for arithmetic teaching for primary school students
  - Project for EE356 Electronic Product Design
- **Diode-based temperature sensor. (UG)** 2020
  - Development of a temperature sensor that investigates the temperature dependence of the VI characteristic of a diode
  - Project for EE251 Electronic Measurements Course
- **Phoenix. (UG)** 2019
  - A PID-controlled line follower robot presented for a contest organized by IEEE Student Chapter of University of Peradeniya, Sri Lanka (DEEEP SPEED 2019) - [1<sup>st</sup> place of out of 84 contestants.](#)
- **Optical Morse Code Transceiver. (UG)** 2019
  - A multi-threaded, Morse code transmitter-receiver pair based on optical signals
  - Project for GP106 Computing

## PROFESSIONAL EXPERIENCE

### University of Peradeniya

Peradeniya, Sri Lanka

Department of Electrical and Electronic Engineering, Faculty of Engineering.

#### ► Temporary Lecturer

Mar 2025 - Present

- Conducted the senior undergraduate course EE514 Data Communications.
- Supervised laboratory courses, and mentored junior instructors.
- Contributed to curriculum development and modernization of teaching laboratories.

#### ► Temporary Instructor

Jan 2024 - Feb 2025

- Conducted and assessed undergraduate laboratory experiments across core, elective, and first-year courses.
- Developed new experiments and enhanced instructional materials.

### Synopsys, Inc.

Colombo, Sri Lanka

Applications Engineering, and Research & Development Divisions.

#### ► Electronic Engineering Intern

Jan 2022 - May 2022

- Developed a software solution for random testing of software
- Exposure: *Python, SystemVerilog, RTL Static Verification*
- Achievements: [Title Winner](#) of LevelUp 2022: Intern Project Presentation Competition

## HONOURS AND AWARDS

#### ► SLASSCOM National Ingenuity Awards (Won).

2025

- Winner in the category “Best Innovative Product in Healthtech” - [National](#), and [Provincial \(Central Province\)](#) for the project “Wearable Device and AI based Analysis for Human Motion Capture”.

#### ► Manamperi Award (Nominated).

2024

- Nominated for the Best Undergraduate Research Project award in Engineering ([island-wide, Sri Lanka](#)) by Sri Lanka Association for the Advancement of Science (SLAAS) for the research project “Hand Gesture Recognition and Gait Analysis using Wearable Devices”.

#### ► Eng. E.W. Karunarathne Award (Nominated).

2022/2023

- Nominated for the Best Undergraduate Project in Electrical Engineering ([island-wide, Sri Lanka](#)) award for the research project “Hand Gesture Recognition and Gait Analysis using Wearable Devices”.

#### ► Dr Tilak Peiris Award for the Best Performance in the General Programme in Engineering.

2020

- Best performance in First Year at Faculty of Engineering (Batch of 2017), University of Peradeniya.
- GPA 3.95/4.00 ([Ranked 1<sup>st</sup> out of 416](#))

## SKILLS

Programming	C, C++, Python, Assembly
Hardware	ESP, PIC, Arduino, Raspberry Pi, Altium Designer, Verilog HDL, SystemVerilog
Mathematical Computing	Mathematica, MATLAB, GNU Octave
Systems Simulation	PSCAD, SPICE, Proteus
CAD	Autodesk AutoCAD, Autodesk Fusion 360, DS SolidWorks
Graphic Designing	LaTeX, Adobe InDesign, Inkscape, Microsoft Office
Languages	English, Sinhala

## ADDITIONAL ACTIVITIES

### Professional Memberships

#### Institution of Electrical and Electronic Engineers (IEEE) - Graduate Student Member

Graduate Student Member  
Student Member

2025 - Present  
2019 - 2025

#### Engineering Council Sri Lanka (ECSL) - Associate Engineer

Associate Engineer

2025 - Present

#### Institution of Engineers, Sri Lanka (IESL) - Associate Member

Associate Member  
Student Member

2025 - Present  
2021 - 2025

## Volunteering

- **Member of Organizing Committee** - ACES Pre-Coders v10.0 and ACES Coders v10.0 (Sep-Oct 2023).  
*An algorithmic programming competition organized by Association of Computer Engineering Students (ACES), Department of Computer Engineering, University of Peradeniya, Sri Lanka.*  
Contribution: *Problem design and planning, Coordination of the Contest*  
Exposure: *Data structures and algorithms, computational geometry*

## Other Achievements

- Oct 2022 **IEEEExtreme 16.0**: An international 24-hour algorithmic programming competition organized by IEEE. [Participation]
- Jun 2022 **LevelUp 2022**: Intern project presentation competition organized by Synopsys, Inc. [1<sup>st</sup> place]
- Oct 2021 **IEEEExtreme 15.0**: An international 24-hour algorithmic programming competition organized by IEEE. [Participation]
- Oct 2020 **IEEEExtreme 14.0**: An international 24-hour algorithmic programming competition organized by IEEE. [Top 40 in Sri Lanka, Top 400 in the world]
- Oct 2020 **MoraXtreme 5.0**: A national 12-hour algorithmic programming competition organized by University of Moratuwa, Sri Lanka. [16<sup>th</sup> Place]
- Mar 2020 **ACES Coders 8**: A national 12-hour algorithmic programming competition organized by University of Peradeniya, Sri Lanka. [15<sup>th</sup> Place]
- Dec 2019 **DEEEP SPEED 2019**: A Line Follower Robot Competition organized by the organized by IEEE Student Branch, University of Peradeniya, Sri Lanka. [1<sup>st</sup> place out of 84]
- Oct 2019 **IEEEExtreme 13.0**: An international 24-hour algorithmic programming competition organized by IEEE. [Top 5 in Sri Lanka, Top 150 in the world]
- Sep 2019 **ACES Hackathon 2019**: An inter-university hackathon organized by University of Peradeniya, Sri Lanka. Idea: Image processing-based detection of freshness of tomatoes. [Participation]
- Mar 2019 **UoJ Coders v1.0**: A national 12-hour algorithmic programming competition organized by University of Jaffna, Sri Lanka. [Participation]

## Other Interests

Music and Acoustics, Astrophysics, Competitive Programming, Photography, Electronic Circuit Fabrication

## REFERENCES

### **Prof GMRI Godaliyadda**

*PhD (NUS), BScEng (Peradeniya), SMIEEE, AMIESL*

Professor

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Faculty of Engineering,  
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### **Prof MPB Ekanayake**

*PhD (Texas Tech), BScEng (Peradeniya), SMIEEE, AMIESL*

Professor

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### **Prof HMVR Herath**

*Dr.-Ing (Paderborn), MS (Miami), BScEng (Peradeniya), CEng, SMIEEE, MIESL, MOSA*

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