

# Mahela Pandukabhaya

BScEng (Hons.) (Pera), MIEEE, sMIESL

## Temporary Lecturer

Department of Electrical and Electronic Engineering,  
University of Peradeniya,  
Peradeniya 20400, Sri Lanka.

✉ [vkmpandukabhaya@gmail.com](mailto:vkmpandukabhaya@gmail.com)  
in [mahela-pandukabhaya](https://www.linkedin.com/in/mahela-pandukabhaya)  
🌐 [mahela-pandukabhaya.github.io](https://mahela-pandukabhaya.github.io)  
☎ +94 71 131 2787

## RESEARCH INTERESTS

Signal Processing  
Sensors

Biomedical Engineering  
Instrumentation

Artificial Intelligence  
Electronics

Controls  
Acoustics

## EDUCATION

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

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

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

Thesis: Hand Gesture Recognition and Gait Analysis via Wearable Devices

Advised by: Prof. GMRI Godaliyadda, Prof. MPB Ekanayake, Prof. HMVR Herath, Dr JV Wijayakulasooriya,  
Prof. RMCJ Rathnayake

Nov 2018 - Dec 2023

Peradeniya, Sri Lanka

### Primary and Secondary Education

[Trinity College, Kandy.](#)

Jan 2003 - Sep 2017

Kandy, Sri Lanka

G.C.E. Advanced Level (University Entrance Examination)

Aug 2017

- Physical Sciences (Mathematics, Physics, and Chemistry), Z-score: 1.9141

- District Rank: 49 (Kandy)

G.C.E. Ordinary Level

Dec 2013

## EXPERIENCE

### University of Peradeniya

Department of Electrical and Electronic Engineering, Faculty of Engineering.

Peradeniya, Sri Lanka

#### ► Temporary Lecturer

Mar 2025 - Present

Courses Conducted:

- EE514 Data Communications

#### ► Temporary Instructor

Jan 2024 - Feb 2025

Responsibilities:

- Conducted and assessed laboratory sessions for undergraduate courses including fundamental EEE courses

- Developed and Implemented laboratories for undergraduate courses in the EEE curriculum

### Synopsys, Inc.

Applications Engineering, and Research & Development branches

Colombo, Sri Lanka

#### ► Electronic Engineering Intern

Jan 2022 - May 2022

Responsibilities:

- Development of 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 2025 (Won).

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 (2024) (Nominated).

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 (2022/2023) (Nominated).**

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) (Won).**

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](#))

## 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](#).

## 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](#)

### International Conferences

- [C<sub>4</sub>] **Estimation of Angle of Significance in Human Joint Angles Using Kalman Filter and Principal Component Analysis.** 2025 Aug
- [VKM Pandukabhaya](#), NT Meghapathirana, RMUO Ratnayake, RMBN Rathnayaka, GMRI Godaliyadda, MPB Ekanayake.
  - In *IEEE 19<sup>th</sup> International Conference on Industrial and Information Systems (ICIIS) 2025*.
  - Under Review
- [C<sub>3</sub>] **LSTM based Model for Weather-based Solar Irradiance Prediction for Long-Term PV Energy Planning.** 2025 July
- 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*.
  - Under Review
- [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](#)
- [C<sub>1</sub>] **Quality Assessment of Welding using Regression Analysis of Biomechanical Data.** 2024 Aug
- [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](#)
  - **Best Paper Award** (Technology Management Track), Presenting Author.

## RESEARCH AND PROJECTS

### Postgraduate Research

- **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

- ▶ **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 \(pending\)](#)

### Undergraduate

- ▶ **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 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 MEMBERSHIPS

- Institution of Electrical and Electronic Engineers (IEEE)**
  - Member 2024 - Present
  - Student Member 2019 - 2023
- Institution of Engineers, Sri Lanka (IESL) - Student Member**
  - Student Member 2021 - Present

## 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](#)]
- Feb 2020 **Google Hash Code 2020**: An international algorithmic programming competition organized by Google LLC.  
[[Participation](#)]
- 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](#)]

## SKILLS

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

## OTHER INTERESTS

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

## REFERENCES

### Prof GMRI Godaliyadda

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

Professor

Department of Electrical and Electronic Engineering,  
Faculty of Engineering,  
University of Peradeniya.  
Sri Lanka.

Email: [roshangodd@ee.pdn.ac.lk](mailto:roshangodd@ee.pdn.ac.lk)

### Prof MPB Ekanayake

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

Professor

Department of Electrical and Electronic Engineering,  
Faculty of Engineering,  
University of Peradeniya.  
Sri Lanka.

Email: [mpb.ekanayake@ee.pdn.ac.lk](mailto:mpb.ekanayake@ee.pdn.ac.lk)

### Prof HMVR Herath

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

Professor

Department of Electrical and Electronic Engineering,  
Faculty of Engineering,  
University of Peradeniya.  
Sri Lanka.

Email: [vijitha@eng.pdn.ac.lk](mailto:vijitha@eng.pdn.ac.lk)

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