

# RAHAL THARAKA NANAYAKKARA

rahaltharak@gmail.com  
[www.linkedin.com/in/rahal-nanayakkara/](https://www.linkedin.com/in/rahal-nanayakkara/)  
[rahalnanayakkara.github.io](https://rahalnanayakkara.github.io)

## PROFILE

I am a final year electrical and electronic engineering undergraduate, with practical experience and theoretical knowledge in areas covering mechanical, electrical, electronic and computer engineering. I am passionate about learning new things to understand theory and to work on research projects to produce results.

## INTERESTS

- Signal Processing
- Control Systems
- Robotics
- Machine Learning

## EDUCATION

### BSc Engineering (Hons.) Undergraduate

2017 Nov - Present

Department of Electrical and Electronic Engineering  
University of Peradeniya

**4.0 / 4.0 GPA with A+ for all modules (Top of the class)**

### G.C.E Advanced Level Examination

2016

Trinity College, Kandy, Sri Lanka  
3A Passes for Combined Maths, Physics and Chemistry  
Z-score : 2.7522

**District Rank : 1 out of 2,987**

**National Rank : 14 out of 33,608**

### G.C.E Ordinary Level Examination

2013

Trinity College, Kandy, Sri Lanka  
9A Passes

## PUBLICATIONS

### Integrated Video Based Crowdedness Forecasting Framework with a Review of Crowd Counting Models

2021

L.B.I.P. Thilakasiri, D.M.P.M. Alwis, **R.T. Nanayakkara**, G.M.R.I. Godaliyadda,  
M.P.B. Ekanayake, H.M.V.R. Herath, J.B. Ekanayake  
*IEEE 16th International Conference on Industrial and Information Systems (ICIIS)*

### Design and fabrication of Handheld CNC Platform for Engineering Teaching

2018

A. Pallegedara, **R. Nanayakkara**  
*Annual Sessions of IESL 2018, pp. [589-594]*

## PATENTS

### A multi-sensory fetal movement analyzing device

2022

D.M.P.M. Alwis, **R.T. Nanayakkara**, L.B.I.P. Thilakasiri, V.K.M. Pandukabhaya, M.P.B. Ekanayake,  
G.M.R.I. Godaliyadda, J.V. Wijayakulasooriya, R.M.C.J. Ratnayake  
*Status : Pending*

## SELECTED PROJECTS

### **Fetal Movement and Respiratory Pattern Monitoring and Analysis of Pregnant Females (ongoing)** **2022**

Final Year Research Project. Monitoring health and wellbeing of pregnant mothers using inertial measurement sensors mounted on a wearable belt.

*Technologies: Python, TensorFlow, Arduino*

*Techniques: Signal Processing, Classical Machine Learning, Neural Networks*

### **CAN Bus Display** **2022**

Hobby Project. An ESP32 based device that can read and decode CAN Bus messages and display various parameters on an LCD display

*Technologies: CAN Bus, ESP32*

*Techniques: Embedded C, Hardware Design*

### **Color Sensor for the Visually Impaired** **2021**

3rd Year Electronic Product Design Project. Color Identification and Object Detection for the visually impaired via 3D feedback about the surrounding using 3D sound generation.

*Technologies: Python, Numpy, OpenCV*

*Techniques: Spatial Audio Generation, Text-to-speech generation, PCB Designing*

### **Smart greenhouse monitoring and automation system** **2021**

3rd Year Embedded System Design Project. Implemented a smart greenhouse capable of monitoring and controlling parameters such as humidity, soil moisture and light.

*Technologies: PIC16f873A, MPASM*

*Techniques: Assembly Programming, PCB Designing*

### **Pulse rate measuring wearable device** **2020**

2nd Year Project. A wearable device for estimating the pulse rate of a patient by measuring the transmittance of infrared light through the finger.

*Technologies: Arduino*

*Techniques: Hardware Design, Frequency Analysis*

### **Intelligent CCTV System** **2019**

Tracking people and detecting unattended baggage using a neural network based CCTV System. Won awards in multiple hackathons.

*Technologies: Python, Numpy, OpenCV, TensorFlow*

*Techniques: Neural Networks, Data Clustering*

### **Micromouse - Autonomous Maze Navigating Robot** **2019**

Autonomous maze navigation robot using custom-made sensors for a "micromouse" maze navigating competition.

*Technologies: Arduino, IR Sensors, Gyroscopes*

*Techniques: Graph Theory, PID Control, Sensor Calibration*

### **Landslide Detection System** **2018**

A prototype device which monitors shear strain of soil in landslide prone areas in order to predict landslides. Placed 1st at the 2018 ACES Hackathon

*Technologies: Arduino, ESP32, Gyroscopes*

*Techniques: WiFi communication*

## AWARDS

<b>Bartholomeusz Prize for Engineering Mathematics</b>	<b>2019</b>
Awarded for best performance in mathematics modules in the 1st year	
<b>Bronze Medal at the Sri Lanka Mathematics Olympiad</b>	<b>2017</b>
Ranked 5th overall. Conducted by the Sri Lanka Olympiad Mathematics Foundation.	
<b>Mahapola merit scholarship</b>	<b>2017</b>
Awarded by the Government of Sri Lanka for excellent performance at G.C.E (A/L) Examination	
<b>Mahinda Ellepola Memorial Medal</b>	<b>2017</b>
Awarded by Trinity College, Kandy, for academic excellence at Advanced Level Examinations	
<b>Subject Prizes for Mathematics, Physics and Chemistry</b>	<b>2015, 2016</b>
Won in the penultimate school year and final school year	

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## COMPETITIONS

<b>IEEEXtreme 14.0</b>	<b>2020</b>
24 hour global algorithmic programming competition National Rank - 2, World Rank - 68	
<b>IEEEXtreme 13.0</b>	<b>2019</b>
24 hour global algorithmic programming competition National Rank - 5, World Rank - 130	
<b>MoraXtreme 4.0</b>	<b>2019</b>
12 hour algorithmic programming competition among Sri Lankan teams Ranked 1st out of 150+ teams	
<b>ACES Hackathon</b>	<b>2019</b>
1st place in Travel and Safety Category. Project : Neural Network based CCTV System for tracking individuals and unattended baggage	
<b>SLIIT Robofest</b>	<b>2019</b>
3rd place in the undergraduate category Task : Autonomous Maze Navigating Robot (Micromouse)	
<b>ACES Hackathon</b>	<b>2018</b>
1st place in Network and System Category Project : Landslide Detection System	

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## ADDITIONAL COURSES FOLLOWED

<b>Neural Networks and Deep Learning</b>	<b>2020</b>
Conducted by DeepLearning.AI through Coursera [ <a href="#">Link</a> ]	
<b>Convolutional Neural Networks</b>	<b>2021</b>
Conducted by DeepLearning.AI through Coursera [ <a href="#">Link</a> ]	

## VOLUNTEERING

### Conducted "Introduction to python" webinars

2021

On behalf of SEDS Peradeniya Chapter for school students and first year undergraduates as part of the "AI in space" webinar series

### Conducted Arduino and IOT workshops for school students and teachers

2019, 2021

Conducted by students and staff members of the Faculty of Engineering, to promote IT education among young students

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## EXPERIENCE

### 2022 Aug - 2022 Oct Vega Innovations

Trainee Engineer

Project - Implement over the air firmware updates on embedded microcontrollers  
- Developing flux weakening algorithms for high speed control of Permanent Magnet Synchronous Motors

### 2019 Nov - 2020 Feb Sri Lanka Institute of Nanotechnology (SLINTEC)

Trainee Engineer

Project - Manufacture of enhanced lead acid batteries with graphene based negative electrodes for improved performance  
- Design the electrical power distribution system for a graphene oxide production plant

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## SKILLS

### English Language Proficiency

Overall IELTS Band Score of 8.5

Listening 9

Reading 9

Writing 7.5

Speaking 9

### Programming Languages

Python, Java, C

### Hardware Platforms

Arduino based, Raspberry Pi

### 3D Modelling

AutoCAD

### Numerical Computing

MATLAB, Octave, Numpy

### Practical Skills

Soldering, Wiring, PCB design and development

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## REFEREES

### Prof. Roshan Godaliyadda

PhD (NUS), Bsc. Eng  
Department of Electrical and Electronic Engineering  
University of Peradeniya  
roshangodd@ee.pdn.ac.lk

### Prof. Parakrama Ekanayake

PhD (Texas Tech), Bsc. Eng  
Department of Electrical and Electronic Engineering  
University of Peradeniya  
mpb.ekanayake@ee.pdn.ac.lk