# MEVAN WIJEWARDENA

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## RESEARCH INTRODUCTION

I have a strong affinity towards mathematics and I am highly inspired by its applications in real-world scenarios. Due to my passion towards applied statistics and probability, I am keen on contributing to the development of theoretical frameworks which lie in the intersection of statistical machine learning, statistical signal processing, communications and information theory. I also have a passion towards discrete mathematics, specifically number theory and combinatorics.

## EDUCATION

**University of Moratuwa, Mortuwa, Sri Lanka** Nov. 2016 - Aug. 2021
BSc Engineering Honours Degree. Expected month of graduation- Dec. 2021
Department of Electronic and Telecommunication Engineering. CGPA- 4.06 out of 4.2
Dean's list placements - Semesters **1, 2, 3, 4, 7, 8** **Ranked** 5 **out of** 101.

**University of Auckland, New Zealand** Jun. 2019 - Dec. 2019
Visiting Student.
Augmented Human Lab.
Worked on two research projects (MAGHair and AiSee) in human computer interaction.

**Maliyadeva College, Kurunegala, Sri Lanka** Feb. 2002 - Aug. 2015
GCE Advanced Level Examination. Z-score- 3.0383, **Ranked** 5 **out of** 32393

## ACADEMIC ACHIEVEMENTS

- International Mathematical Olympiad (IMO) - **bronze medals** 2012, 2013, 2014, 2016
- International Mathematics Competition for University Students - **bronze medal** 2018
- International Mathematics Competition (IMC) - **bronze medals** 2012, 2013
- Asia Pacific Mathematical Olympiad (APMO) - **silver medal** 2016
- Asia Pacific Mathematical Olympiad (APMO) - **bronze medals** 2014, 2015
- Asian Physics Olympiad - **participation** 2016
- Sri Lanka Mathematical Olympiads (SLMO) - **gold medals** 2012, 2013, 2014, 2016
- Sri Lanka Physics Olympiad - **gold medal** 2015
- Sri Lanka Mathematical Olympiads (SLMO) - **bronze medal** 2011
- W.D.Gunarathne memorial gold medallist 2012, 2014, 2016

## WORK EXPERIENCE

**University of Moratuwa, Moratuwa, Sri Lanka** Jul. 2021 - Present
Lecturer.
Department of Electronic and Telecommunication Engineering.

- Teaching assistant for the module EN2040 - Random Signals and Processes.
- Conducting lab sessions for the modules EN2090 - Laboratory Practice - II, EN2022 - Digital Electronics.

## PUBLICATIONS

- **M. Wijewardena**, T. Samarasinghe, K. T. Hemachandra, S. Atapattu and J. S. Evans, **"Physical Layer Security for Intelligent Reflecting Surface Assisted Two–Way Communications,"** in IEEE Communications Letters, vol. 25, no. 7, pp. 2156-2160, July 2021.

- R. Boldu, **M. Wijewardena**, H. Zhang, and S. Nanayakkara, **"MAGHair: A Wearable System to Create Unique Tactile Feedback by Stimulating Only the Body Hair,"** in 22nd International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI '20), Oct. 2020.
- **M. Wijewardena**, S. Pathiranage, T. Nanyakkara, I. Rajapakshe, S. Charles and T. Samarasinghe, **"Sequence-to-short Sequence Learning with Attention Based Autoencoders for Non-Intrusive Load Monitoring"** in progress.

## PROJECTS

- **Non-Intrusive Load Monitor** Feb. 2020 - Jul. 2021
  - A smart energy meter capable of inferring the appliance level power consumption given the aggregate power consumption for a household setup in real time.
  - Through this project our group aimed at building a low-cost system to reduce the household energy wastage by providing real-time feedback on appliance level power consumption.
  - I developed the machine learning based algorithm for the task. This included experimenting models such as additive factorial hidden markov models and attention based neural networks.
  - Our group proposed a novel modelling methodology which outperformed the state of the art.
- **MAGHair** Jun. 2019 - Aug. 2019
  - A wearable system to create unique tactile feedback by stimulating only the body hair using controlled magnetic fields.
  - The long-term goal of this project is to develop a mechanism which is capable of providing notifications to people with visual and auditory impairments.
  - I developed the algorithm to control the magnetic fields with minimum power consumption.
  - We built the initial prototype which was able to generate smooth and distinguishable skin sensations.
- **AiSee** Sept. 2019 - Dec. 2019
  - A system to help visually impaired people in their day to day activities specially in shopping.
  - This system can act as a virtual companion of visually impaired person specially during day to day activities such as shopping.
  - I developed a deep learning based algorithm which is capable of identifying products in a supermarket and convey the information to the person through speech.
- **Automated Shade Net** Jan. 2019 - May 2019
  - A shade net setup for orchid plantations, where humidity and temperature are measured and controlled automatically.
  - Implementing green houses is costly and is unaffordable to most of the Sri Lankan orchid cultivators. Hence, our group focused on developing a low cost solution.
  - I developed the algorithm for the temperature and humidity controlling mechanism.

## HACKATHON EXPERIENCE

- IEEExtreme programming competition - 2020 — world rank - **52**, country rank - **1**
- Google code jam - 2020 — Qualified for round 2, world rank - **2839**, country rank - **2**
- Google hash code - 2020 — world rank - **549**, country rank - **3**
- Google hash code - 2019 — world rank - **1655**, country rank - **2**
- Google code jam - 2019 — Qualified for round 2, world rank - **1011**, country rank - **2**
- IEEExtreme programming competition - 2018 — world rank - **91**, country rank - **4**
- HackStat(a data science hackathon) - 2018 — **second runners up**
- IEEExtreme programming competition - 2017 — world rank - **127**, country rank - **2**
- MoraXtreme programming competition - 2017 — **champions**

## COURSES AND CERTIFICATIONS

- Machine Learning, Neural Networks and Deep Learning, Improving Deep Neural Networks, Sequence models, Probabilistic Graphical Models 1: Representation - Stanford University, Coursera.
- EE263 Introduction to Linear Dynamical Systems, EE364A Convex Optimization 1, Classical Mechanics - Stanford University.
- Introduction to Complex Analysis - Wesleyan University, Coursera.
- Bayesian Methods for Machine Learning (with Honours) - Higher School of Economics, Coursera.

## LEADERSHIP ROLES/VOLUNTEERING

- Problem setter at uMora online mathematics competition 2020.
  - The competition was held under three categories, middle school, high school and undergraduate and was open to all the students from Sri Lanka.
- Problem setter at MoraXtreme algorithmic programming competition 2019.
  - The competition was open to all the undergraduate students in Sri Lanka.
- President of the mathematics society of university of Moratuwa (2018-2019).
  - Conducted maths stalls at Innovatus'18 and Expose'19 exhibitions.