

## Hiruna Madushan Samarakoon

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### RESEARCH INTERESTS

Bioinformatics, Algorithm Optimization CPU/GPU, Embedded Systems, FPGA, HPC, Mobile Computing, Networking and Security, Machine learning/ Artificial Intelligence

### EDUCATION

**University of Peradeniya**, Peradeniya, Sri Lanka Nov 2015 – July 2020  
B.Sc. Eng in Computer Engineering

- Class: First Class Honors
- Cumulative **GPA: 3.95 / 4.00**
- Dean's List 8/8 semesters
- Related Core Modules: Signal Processing, Electronic Devices & Circuits, Embedded Systems, Computer Architecture, Operating Systems, Computer Systems Engineering, Communication Networks, Theory of Computation, Database Systems, Machine Learning & Data Mining.

**Trinity College Kandy**, Kandy, Sri Lanka Jan 2006 – Dec 2014

- 4 Distinction passes in Physical Science in the GCE Advanced level examination.
- Ranked 64<sup>th</sup> in Sri Lanka; 11<sup>th</sup> in Kandy District.

### EXPERIENCE

**Agricultural Biotechnology Center**, University of Peradeniya. Aug 2020 - Present  
Research Assistant - plant genomics supervised by Prof. Pradeepa Bandaranayake

### PUBLICATIONS

1. Gamaarachchi, H., Lam, C.W., Jayatilaka, G., **Samarakoon, H.**, Simpson, J.T., Smith, M.A. and Parameswaran, S., 2020. GPU accelerated adaptive banded event alignment for rapid comparative nanopore signal analysis. *BMC bioinformatics*, 21(1), pp.1-13.
2. **Samarakoon, H.**, Punchihewa, S., Senanayake, A., Hammond, J.M., Stevanovski, I., Ferguson, J.M., Ragel, R., Gamaarachchi, H. and Deveson, I.W., 2020. Genopo: a nanopore sequencing analysis toolkit for portable Android devices. *Nature Research Communications biology*, 3(1), pp.1-5.
3. **Samarakoon, H.**, Ranasinghe, Y., Suriyage, M., Submitted in 2020, November, "Search Algorithm for a swarm robot system to monitor environmental conditions of a greenhouse", Submitted to 2021 12th International Conference on Mechatronics and Manufacturing (ICMM 2021) (Awaiting reviews)
4. Rajapakse, N., **Samarakoon, H.**, Jayawardana, N., Wijesundara, S. and Bandaranayake, P., Submitted in 2020, December, "Molecular and morphological evidence for new species of *Strobilanthes medahinnensis* (Acanthaceae) from the Peak Wilderness Nature Reserve in Sri Lanka", Submitted to Phytotaxa Peer-reviewed journal (Awaiting reviews)

### RESEARCH PROJECTS

**Real-time DNA Methylation Profiling by aggregating computing power of smartphones** 2019/20  
University of Peradeniya. Supervised by Prof. R. Ragel and Mr. H. Gamaarachchi  
Extending work listed under publications (2), using portable sequencing technologies like Oxford Nanopore Technology we investigate the possibility to execute a DNA methylation calling pipeline data batch-wise in parallel with sequencing.

**Optimizing nanopore raw signal reads based bioinformatic software** 2020  
The file format called Hierarchical Data Format (HDF) used by nanopore reads is time-consuming and results in poor thread utilization. To circumvent it, a flat-file format is being designed with several times faster I/O performance.

**Study the diversity and distribution pattern of genus *Strobilanthes* Blume in Sri Lanka** 2020  
University of Peradeniya. Supervised by Prof. Pradeepa Bandaranayake  
Chloroplast genome assembly and DNA analysis of 40+ plant species in *Strobilanthes* genus to find unique molecular markers to appreciate the diversity. This research has produced the work listed under publications (4).

**Network packets routing simulation software** 2017  
University of Peradeniya. Supervised by Dr. K. Ratnam  
Open-source software was designed to examine the associated delays and traffic in a predefined network topology. Adding new packets and modifying the topology are supported at runtime through a GUI.

## AWARDS AND HONORS

- 2020 - Presented the work listed under publications (2) as one of the top three spotlight speakers at Nanopore Community Meeting (NCM) 2020 - a conference dedicated to scientific research using nanopore DNA/RNA sequencing.
- 2020 - **2<sup>nd</sup> runners up** at Data Storm v1.0, a machine learning and data science competition, organized by the Rotaract clubs of the University of Moratuwa and University of Colombo.
- 2019 - **2<sup>nd</sup> runners up** at Brainstorm 2019, Sri Lanka's Premier Biomedical Engineering Design Competition, organized by the IEEE EMBS Student Branch Chapter at University of Moratuwa.
- 2018 - **1<sup>st</sup> runners up** at iHack 4.0, a 24-hour inter-university software development hackathon, organized by University of Colombo School of Computing ISACA Student Group
- 2017 - **2<sup>nd</sup> runners up** at ACES Hackathon 2017 a software development hackathon, organized by the Association of Computer Engineering Students (ACES), Faculty of Engineering, University of Peradeniya.
- 2016 and 2017 - **successful participation** at ACES Coders, an algorithmic programming competition organized by ACES.

## OTHER PROJECTS

- A CPU implementation including ALU and memory management hierarchy written in VHDL
- An Image Processing Library written in Assembly language
- A Peripheral Interface Controller (PIC) as a USB interface for general-purpose I/O operations
- A social advertising platform to promote small scale business

## WORK EXPERIENCE

- Instructor - University of Peradeniya, Sri Lanka Sept 2019 – July 2020
- Industrial Trainee – 20face, Enschede, the Netherlands Feb 2019 – Aug 2019
- Voluntary Network Administrator – Teaching Hospital, Kandy, Sri Lanka Jun 2018 – Sept 2018

## SKILLS

- Programming skills: Python, Matlab, Java, C/C++, R.
- Technical skills: Arduino, Processing Java, FreeCAD, AutoCad, Fritzing, MPLAB, EAGLE, Proteus, Simulink.
- Mathematics: Numerical methods, Linear algebra, Partial differential equations, Fourier series, Number theory, Graph Theory, Stochastic Processes, Optimization, Operational Research
- Languages: English (Professional fluency), Sinhala (Native)

## EXTRACURRICULAR

- Leadership: President Sinhala Literary Union, Trinity college, Leader in all the group projects and competitions listed under awards and honors, Trinity college U13,15,17 hockey team vice-captain.
- Team member: OGET 2018/19 team AIESEC University of Peradeniya, Music Society - UoP, Ceylon University Dramatic Society Member - "Lullaby" Drama won the Best Play and Stage Management 2016
- Sports: University Colors - Hockey 2016/17/18, Hockey, Cricket, and Chess at Trinity College Kandy.

## REFERENCES

Prof. R. Ragel  
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