Hiruna Madushan Samarakoon

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RESEARCH INTERESTS	Bioinformatics, Algorithm Optimization CPU/GPU, Embedded Systems, HPC, Signal Processing

EDUCATION

UNSW, Sydney, Australia   May 2021 - Present
Garvan Institute of Medical Research, Sydney Australia

· PhD Candidate in Computer Science & Engineering
· Field of Research - Medical biotechnology diagnostics and Energy-efficient computing

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**

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

· 4 Distinction passes in Physical Science in the GCE Advanced level examination.
· Ranked 64th in Sri Lanka; 11th in Kandy District.

EXPERIENCE

Agricultural Biotechnology Center, University of Peradeniya.   Aug 2020 - Mar 2021
Research Assistant - plant genomics supervised by Prof. Pradeepa Bandaranayake

PUBLICATIONS

1. **Samarakoon, H.**, Ferguson, J.M., Gamaarachchi, H. and Deveson, I.W., 2023. Accelerated nanopore basecalling with SLOW5 data format. bioRxiv, pp.2023-02(submitted to Bioinformatics).
2. **Samarakoon, H.**, Ferguson, J.M., Jenner, S.P., Amos, T.G., Parameswaran, S., Gamaarachchi, H. and Deveson, I.W., 2022. Flexible and efficient handling of nanopore sequencing signal data with slow5tools. bioRxiv, pp.2022-06 (minor revision at Genome Biology).
3. Gamaarachchi, H., **Samarakoon, H.**, Jenner, S.P., Ferguson, J.M., Amos, T.G., Hammond, J.M., Saadat, H., Smith, M.A., Parameswaran, S. and Deveson, I.W., 2022. Fast nanopore sequencing data analysis with SLOW5. *Nature biotechnology*, pp.1-4.
4. Nilanthi, R.M.R., **Samarakoon, H.**, Jayawardana, N., Hathurusinghe, B., Wijesundara, S. and Bandaranayake, P.C.G., 2022. Strobilanthes glandulata (Acanthaceae), a new species from Sri Lanka based on morphological and molecular evidence. **Phytotaxa**, 573(1), pp.1-14.
5. Nilanthi, R.M.R., **Samarakoon, H.**, Jayawardana, N., Wijesundara, S. and Bandaranayake, P.C.G., 2021. Strobilanthes medahinnensis (Acanthaceae) a new species, based on morphological and molecular data, from the Peak Wilderness Nature Reserve, Sri Lanka. *Phytotaxa*, *514*(1), pp.26-38.
6. **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 Android devices. *Nature Research* Communications biology, 3(1), pp.1-5.
7. 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.

RESEARCH PROJECTS

Extracting hidden information from the nanopore raw signals   2022/23
For my Phd work I am using classical signal processing techniques to extract information from the raw nanopore signals to better understand the behavior of the signals and the DNA molecules.

Optimizing nanopore raw signal reads based bioinformatic software   2020/21

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. Work is listed under publications (1).

Study the diversity and distribution pattern of genus Strobilanthes Blume in Sri Lanka 2020/21
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 (3).

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 in parallel with sequencing.

AWARDS AND HONORS	· 2022 - Presented work listed under publications (2) at Australasian Genomic Technologies Association (AGTA) 2022 · 2020 - Presented the work listed under publications (5) 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. · 2019 - **2nd 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 - **1st 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.
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 · 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.
SUPERVISORS	Prof. Sri Parameswaran Head of School and Professor, School of Electrical and Information Engineering University of Sydney, Australia +61 2 9385 7223 sri.parameswaran@sydney.edu.au

Dr. Ira W. Deveson
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