

RAMITH HETTIARACHCHI

+1 (857) ●●●●●●●● ● [✉ im@ramith.fyi](mailto:im@ramith.fyi) ● [🏠 website](#) ● [🐙 github](#)

SUMMARY

An enthusiastic undergraduate who finds unconventional ways of accomplishing a task, while learning something completely new on his journey. He shares these experiences with the world through his [blog](#).

Research Interests : [Robustness in ML](#) [ML for Physical Sciences](#) [Self-Supervised Learning](#)

EDUCATION

University of Moratuwa

B.Sc. Eng(Hons.) Electronic & Telecommunication Engineering

Moratuwa, Sri Lanka

Oct 2017 - June 2022

– Dean's List: Semesters 1,2,3,4,6,7,8

CGPA : 3.96/4.2

Thesis Title: "A Novel Hardware Accelerated Imaging Cytometry Modality Using Diffractive Deep Neural Networks (D2NNs)"

RESEARCH EXPERIENCE

JULY 2022 - PRESENT

Post Baccalaureate Fellow, Division of Science, Harvard University

Affiliated to SoLab (Dr. Sergey Ovchinnikov) and WadduwageLab (Dr. Dushan Wadduwage) at Harvard University exploring fundamental problems in computational imaging and computational biology.

OCT 2020 - MAR 2021

Research Intern at CSIRO Data61, Australia

The project involved real-time machine vision with a focus on 3D reconstruction from Intel Realsense D435 camera and performing dynamic obstacle avoidance.

PUBLICATIONS

- [1] **R. Hettiarachchi**, U. Haputhanthri, K. Herath, H. Kariyawasam, S. Munasinghe, K. Wickramasinghe, D. Samarasinghe, A. C. De Silva and C. U. S. Edussooriya, "A Novel Transfer Learning Based Approach for Screening Pre-existing Heart Diseases using Synchronized ECG Signals and Heart Sounds," *IEEE International Symposium on Circuits and Systems (ISCAS)*, 2021, pp. 1-5, doi: [10.1109/ISCAS51556.2021.9401093](https://doi.org/10.1109/ISCAS51556.2021.9401093).

↔ [Transfer-learning](#) [ECG ↔ PCG](#) [CNN](#)

- [2] S. Rajapakshe, **R. Hettiarachchi**, "Design and Development of a Research Oriented Low Cost Robotics Platform with a Novel Dynamic Global Path Planning Approach," *2022 8th International Conference on Control, Automation and Robotics (ICCAR)*, 2022, pp. 71-76, doi:[10.1109/ICCAR55106.2022.9782663](https://doi.org/10.1109/ICCAR55106.2022.9782663).

↔ [Path-planning](#) [Visualization](#) [C++](#)

- [3] H. Arguello, J. Bacca, H. Kariyawasam, E. Vargas, M. Marquez, **R. Hettiarachchi**, H. Garcia, K. Herath, U. Haputhanthri, B. S. Ahluwalia, P. So, D. N. Wadduwage, C. U. S. Edussooriya, "Deep Optical Coding Design in Computational Imaging". To appear in *IEEE Signal Processing Magazine Special Issue on Physics-Driven Machine Learning for Computational Imaging, Jan 2023*. [\[link\]](#)

INVITED TALKS

- [1] "Towards Realizable D2NN Designs Through Quantization Aware Training", Nano-SymBioSys workshop at UiT, The Arctic University of Norway - Sep, 2022 - Tromsø, Norway. [\[link\]](#)
- [2] "A Workshop on Healthcare Research: From Sketchbook to Real-world Implementation During a Global Pandemic.", IEEE EMBS International Student Conference. - Feb, 2021 - (Virtual).

PATENT APPLICATIONS

- [1] K. Herath* , U. Haputhanthri*, **R. Hettiarachchi***, H. Kariyawasam*, A. Ahmad, B. S. Ahluwalia, C. U. S. Edussooriya and D. Wadduwage, "Provisional Application – Harvard Ref. No. HU 8932 - F&L Ref. 098930-0366 "Differentiable Microscopy Designs an All-Optical Quantitative Phase Microscope".

PREPRINTS

- [1] A. Ahmad, **R. Hettiarachchi***, A. Khezri*, B. S. Ahluwalia, D.N. Wadduwage, R. Ahmad, “Highly sensitive quantitative phase microscopy and deep learning complement whole genome sequencing for rapid detection of infection and antimicrobial resistance.” [in Review, *Proceedings of the National Academy of Sciences (PNAS)*.]
- [2] U. Haputhanthri, K. Herath, **R. Hettiarachchi**, H. Kariyawasam, A. Ahmad, B. S. Ahluwalia, C. U. S. Edussooriya and D. Wadduwage, “From Hours to Seconds: Towards 100x Faster Quantitative Phase Imaging via Differentiable Microscopy”. [Preprint]
- [3] K. Herath* , U. Haputhanthri* , **R. Hettiarachchi***, H. Kariyawasam* , A. Ahmad, B. S. Ahluwalia, C. U. S. Edussooriya and D. Wadduwage, “Differentiable Microscopy Designs an All Optical Quantitative Phase Microscope”. [Under Review] * equal contribution

OTHER RESEARCH PROJECTS

Configuring an Intelligent Reflecting (IRS) Surface for Wireless Communications

FEB - JUNE, 2021

Supervisor : Dr. Prathapasinghe Dharmawansa, University of Moratuwa.

- Developed an alternative optimization procedure based on a genetic algorithm and the adaptive moment estimation optimizer to find optimized IRS configurations in a 2^{4096} search space. It provided the best data rate and computational cost trade-off, and was the winning solution of the IEEE Signal Processing Cup 2021.

Python Genetic algorithm based optimization Mathematical Modeling

Realtime Sign Language Translation to Speech

JUL - NOV, 2019

Self supervised project.

- Developed a solution capable of mapping the EMG signals obtained by an arm to American sign language gestures using a machine learning model. For high-performance inference, the DE-10 Nano field-programmable gate array is used. Project won the Iron Award at the APAC Finals of innovate FPGA, a global FPGA design contest organized by Intel and Terasic.

C++ SciPy Electromyography (EMG)

HONORS, AWARDS, AND COMPETITIONS

Scholar - 2022 Princeton Pathways to Graduate School program	2022
Winner - IEEE Signal Processing Cup, ICASSP - <i>Team T³</i>	2021
1st Runner Up - IEEE CASS COVID-19 Special Student Design Competition	2020
2nd Runner Up - IEEE IAS CMD Humanitarian Contest	2020
1st in Sri Lanka, 48th in the World - IEEE Xtreme 13.0 Competitive Programming - <i>Team Siraa</i>	2019
APAC - Iron Award - InnovateFPGA - Global FPGA Design Contest	2019
Bronze Medal - ‘Young Computer Scientist’ (YCS) Competition	2012,2013
Bronze Medal - ‘Junior Inventor of the Year’ (JIY) Competition	2010

VOLUNTEER / LEADERSHIP

L2ID @ ECCV 2022	Reviewer	2022
NEURIPS CONFERENCE	Student Volunteer	2021
IEEE SIGNAL PROCESSING SOCIETY, UoM.	Vice-Chairman, Chairman	2020 - 2022
ROTARACT CLUB OF UNIV. OF MORATUWA	Volunteer, Senior Director - IT	2019 - 2021
SUSTAINABLE EDUCATION FOUNDATION	Assistant Program Manager - ScholarX	2020 - 2021
SOCRATIC.ORG	Helping students with Chemistry & Math	2014 - 2016

PROGRAMMING PROFICIENCY

LANGUAGES:	C/C++, Python, Scilab, MATLAB, Mathematica.
VISUALIZATION/TECHNICAL:	Javascript, Processing, Git, L ^A T _E X.
LIBRARIES:	OpenCV, PyTorch, Tensorflow, JAX.

References available upon request.