Hashan Kavinga Weerasooriya ☑ updated CV

Department of Electrical and Electronic
Faculty of Engineering
University of Peradeniya
Sri Lanka

Dedicated, determined, well organized and energetic individual seeking an opportunity to continue studies and scientific research on signal processing and machine learning with the aim of introducing innovative ideas for the betterment of not only the engineering field but also the community.

Academic Qualification

✎ Kingswood College
Feb 2001 - Aug 2014

General Certificate of Education Advanced Level Examination 2014

Combined Maths, Physics, Chemistry (island rank 91, z-score 2.5354)

✎ Faculty of Engineering - University of Peradeniya
Dec 2015 – Jul 2020

BSc Engineering (Hons) in Electrical and Electronic Engineering

The degree was conducted and assessed in English and accredited by Washington Accord

GPA 3.95 out of 4.0 (First Class)

Professional Experience

▦ International Construction Consortium (Pvt) Ltd

Engineering Intern (Mechanical, Plumbing and Electrical) Oct 2017 - Jan 2018
QA/QC Engineering, Engineering Design

I was able to become acquainted with installation, operation and monitoring of the technical services in buildings. The training included areas such as mechanical services – fire protection systems, air conditioning systems, water supply networks, electrical services – low voltage systems, wiring installations, earthing and lighting protection systems. Moreover, I was also able to learn about engineering construction drawings, plans and strategies.

⚲ Ceylon Electricity Board

Engineering Intern (Electrical) Mar 2019 - May 2019
System Control, Generation, Transmission, Distribution, Communication and Design

During the internship program, I was fortunate to visit multiple generation, transmission, distribution stations throughout Sri Lanka and identify the arrangement of the power distribution system. I was able to study about the system planning and transmission line design for distribution networks.

▤ Faculty of Engineering - University of Peradeniya

Temporary Instructor, Temporary Lecturer Aug 2020 - present
Communication and Information Laboratory

As a temporary academic staff member, I have demonstrated, instructed and supervised undergraduate communication laboratories, and I have been assigned as a teaching assistant for the courses - Network Analysis, Electromagnetic Theory, Applied Electromagnetic, Communication Systems, Digital Signal Processing, Telecommunication and Wireless Systems. Moreover, I have been allocated as the representative for the 300 level laboratories in which I handled lab related activities such as scheduling, organizing. In addition, I was able to supervise selected undergraduate projects.

Personal Information

Permanent Residence

⌂ No 92/1,
Godagandeniya,
Peradeniya,
Sri Lanka,
20400.

E-mail

✉ hashankavinga@gmail.com
✉ kavingaweerasooriya@eng.pdn.ac.lk

Telephone

▯ +94 718072262
☎ +94 812384415

Links

G hashankavinga - Google Scholar
⌾ hashankavinga - Github
in hashankavinga - Linkedin

Interest

⭘ Signal Processing
⭘ Machine Learning
⭘ Deep Learning
⭘ Mathematics

Projects and Research

✓ Embedded System – Automatic Lighting and Over Speed Warning System for a Railway Road 2018

Implemented a prototype system which was capable of identifying the presence of a train and speed. The system automatically illuminated the road where the train was, and the region of illuminated area depended on the speed. The system was also programmed to warn the driver if the speed of the train exceeded a limit. The system comprised of PIC16F887A microcontroller and was coded with Assembly language. The main intention was to implement this method for highway roads and hence, reduce the energy consumption and road accidents.

✓ Product Design – Wireless Audio Transmitter and Receiver System 2018

Designed and fabricated a wireless audio system comprising a transmitter and two receiver modules. The audio transmitter device could be plugged into a device so that audio signals coming out of the device could be transmitted to multiple receiver devices . Audio receiver devices were able to be connected to media output devices such as headphones, earphones or speakers. Different functions - Pause/Play/Stop - were added, and each device consisted of rechargeable battery pack. The product was presented at the Electrical and Electronic Engineering Research and Project Symposium 2018

✓ Research Project – Spectral Imaging for Remote Sensing and Applications 2019 - present

The main objectives of this research are two fold. Firstly, available HSI datasets has been exploited to identify the possible earth element deposits. Moreover, under this category, numerous statistical based and deep learning based unmixing methods were introduced to identify the constituents of remotely sensed HSI datasets. And various deep learning spectral enhancement methods are also being experimented upon. Secondaly, a MSI system was proposed and built to capture the different quality parameters of consumables benignly and non-invasively. Various algorithms were proposed to distinguish the salubriousness and consumability of the experimented food items.

● Journal Papers

✔ "**Constrained Nonnegative Matrix Factorization for Blind Hyperspectral Unmixing Incorporating Endmember Independence**", in **IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS)**, Mevan Ekanayake; Hashan Kavinga Weerasooriya; Yasiru Ranasinghe; Sanjaya Herath; Bhathiya Rathnayake; Roshan Godaliyadda; Vijitha Herath; Mervyn Ekanayake (Published - https://doi.org/10.1109/JSTARS.2021.3126664)

✔ "Transmittance Multispectral Imaging for Reheated Coconut Oil Differentiation", in IEEE Access, D. Y. L. Ranasinghe; H. K. Weerasooriya; S. Herath; M. P. B. Ekanayake; H. M. V. R. Herath; G. M. R. I. Godaliyadda and T. Madhujith. (Published - https://doi.org/10.1109/ACCESS.2022.3144841)

✔ "Quantitative Assessment of Adulteration of Coconut Oil Using Transmittance Multispectral Imaging", in Journal of Food Science and Technology - Springer, H.M. Sanjaya Lakmal; H.M.H.K. Weerasooriya; D. Yasiru Lakshan Ranasinghe; W.G.Chaminda Bandara, H.M.Vijitha Rohana Heratha; G.M. Roshan Indika Godaliyadda; M.P. Bandara Ekanayake and T. Madhujith. (Under Review)

● Conference Papers

✔ "Hyperspectral Imaging Based Method to Identify Potential Limestone Deposits", in proceedings of 14th IEEE International Conference on Industrial and Information Systems (ICIIS-2019), Peradeniya, Sri Lanka, December, 2019, D.Y.L. Ranasinghe; H.M.S. Lakmal; H.M.H.K. Weerasooriya; E.M.M.B. Ekanayake; H.M.V.R. Herath; G.M.R.I.Godaliyadda and M.P.B. Ekanayake, (Published - https://doi.org/10.1109/ICIIS47346.2019.9063280)

✔ "Transmittance Multispectral Imaging for Edible Oil Quality Assessment", in Imaging and Applied Optics Congress, OSA Technical Digest (Optical Society of America, 2020), paper JW5C.8., Vancouver, Canada, June, 2020, H.M.H.K. Weerasooriya; H.M.S.Lakmal; D.Y.L. Ranasinghe; W.G.C. Bandara; H.M.V.R. Herath; G.M.R.I. Godaliyadda, M.P.B. Ekanayake; and T.Madujith (Published - https://doi.org/10.1364/3D.2020.JW5C.8)

✔ "Convolutional Autoencoder for Blind Hyperspectral Image Unmixing", in proceedings of 15th IEEE International Conference on Industrial and Information Systems (ICIIS-2020), IIT Ropar, India, November, 2020, D.Y.L. Ranasinghe; H.M.S Lakmal; H.M.H.K. Weerasooriya; E.M.M.B Ekanayake; G.M.R.I Godaliyadda; H.M.V.R. Herath and M.P.B. Ekanayake (Published - https://doi.org/10.1109/ICIIS51140.2020.9342727)

✔ "Reflectance Multispectral Imaging for Identification of Algae Contamination in High Voltage Insulators",in OSA Imaging and Applied Optics Congress, OSA Virtual Meeting, July, 2021, L. Ramanayake; N. Senerath; D. Jayasundara; K. Prabath; H.M.H.K. Weerasooriya; M. Fernando; S. Kumara; V. Herath; R. Godaliyadda; P. Ekanayake and S. Athukorala. (Published - https://doi.org/10.1364/ISA.2021.ITh1B.6)

✔ "Transmittance Multispectral Imaging for Adulteration Assessment of Coconut Oil", in proceedings of 16th IEEE International Conference on Industrial and Information Systems (ICIIS-2021), Neranjan Senarath; Dhananjaya Jayasundara; Lakshitha Ramanayake; D.Y.L. Ranasinghe; Sanjaya Lakmal; H.M.H.K. Weerasooriya; Parakrama Ekanayake; Roshan Godaliyadda; Vijitha Herath and W.M.T. Madhujith (Accepted)

✔ "Multispectral Imaging System to Estimate Sugar Adulteration Level of Black Tea", in proceedings of 16th IEEE International Conference on Industrial and Information Systems (ICIIS-2021), E.M.S.L.B.Ekanayake; W.A.N.D.Wickramasinghe; A.D. Wijesinghe; M.A.C.S. Wijedasa; H.M.H.K.Weerasooriya; D.Y.L. Ranasinghe; M.P.B. Ekanayake; H.M.V.R. Herath; G.M.R.I. Godaliyadda and Terrance Madhujith. (Accepted)

- **Abstract**

  ✔ "Detecting the Freshness and Class of the Fish using Multispectral Imaging", in International Research conference of SLTC 2020, H.M.S. Lakmal; D.Y.L. Ranasinghe; H.M.H.K. Weerasooriya; W.G.C. Bandara; E.M.M.B. Ekanayake,H.M.V.R. Herath; G.M.R.I. Godaliyadda and M.P.B. Ekanayake. (published - http://repo.sltc.ac.lk/handle/1/78)

- **Patent**

  ✔ "A Multispectral Imaging System to Measure Transmittance Spectrum" - Patent application No 20936 (Under Review)

- **Ongoing Research**

  ✔ **Hyperspectral Unmixing using Deep Learning techniques** - The areas of hyperspectral unmixing via deep learning techniques are being explored, and novel architectures will be introduced.

  ✔ **Spectral Enhancement through RGB to Multispectral Mapping** - A generative based deep learning RGB to multispectral mapping algorithm has been developed and will be refined to extract the spectral information of an RGB image.

  ✔ **Mineral Zone Mapping algorithm to identify the potential Limestone Deposits using HSI datasets** - Mathematical and statistical concepts are being incorporated to develop an algorithm to identify the possible limestone deposits and abundances. The research will be expanded to other minerals.

  ✔ **RGB images to identify the Freshness of Fish** - Deep learning based classifier and Android application are being developed to identify the quality grades of fish samples.

Skills

Programming	▸ MATLAB ▸ Python
Frameworks & Libraries	▸ Scikit-learn ▸ Matplotlib ▸ TensorFlow ▸ NumPy ▸ Pandas
CAD Software	▸ CorelDraw ▸ Autodesk AutoCAD
Word Processing	▸ Latex ▸ MS office
Design & Simulator Software	▸ Proteus ▸ AWR - Microwave Office ▸ Autodesk Eagle

Achievements

⊙ W.P. Jayasekara Prize for the best undergraduate project in the Electrical and Electronic department. (2019)
⊙ Prof. E.F. Bartholameusz Endowment Award for the best undergraduate project in Engineering Mathematics among all departments. (2019)
⊙ Nominated for the Eng. E.W. Karunaratne Award for the best undergraduate project in Electrical and Electronic Engineering among all universities. (2020)
⊙ Nominated for the Migara Rathnatunga Trust Awards for industrial training for university undergraduates among all universities. (2020)
⊙ Mahapola merit scholarship for performance in GCE Advanced Level examination. (2014-2019)
⊙ All island traditional dancing competitions. (runners up - 2008, winners - 2010)

Contributions

⊙ Volunteered in 16th IEEE International Conference on Industrial and Information System. (2021)
⊙ Volunteer Instructor at the department of Electrical and Electronic, University of Peradeniya - Conducted laboratory sessions for first year students. (2020)
⊙ Member - Electrical and Electronic Engineering Society. (2019-2020)
⊙ Student member of the Institution of Engineers Sri Lanka, IESL : S-23200. (2017-present)
⊙ Contributed to the Arunalla social service program - participated in activities to conduct Maths seminar series for grade 9-11 students, provided scholarships for students in rural schools, developed infrastructure in a selected rural school and carried out a till program. (2015-2019)

References

Prof. H.M.V.R. Herath
Dept of Electrical and Electronic,
Faculty of Engineering,
University of Peradeniya.
vijitha@eng.pdn.ac.lk

Dr. G.M.R.I. Godaliyadda
Dept of Electrical and Electronic,
Faculty of Engineering,
University of Peradeniya.
roshangodd@ee.pdn.ac.lk

Dr. M.P.B. Ekanayake
Dept of Electrical and Electronic,
Faculty of Engineering,
University of Peradeniya.
mpb.ekanayake@ee.pdn.ac.lk