

HASINDRI SANKALPANA WATAWANA

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RESEARCH INTERESTS

Computer Vision, Machine Learning, Multimodal Learning, Medical Image Analysis, Self-Supervised Learning

EDUCATION

University of Moratuwa, Sri Lanka **Nov 2018 - Jul 2023**

B.Sc. Eng. Hons. in Electronic and Telecommunication Engineering

Dean's List : Semester 1,2,3,4,5,6,7,8

CGPA : 4.04 / 4.2

Devi Balika Vidyalaya, Colombo, Sri Lanka

grad : 2017

GCE Advanced Level Examination

Z-score : 2.2495

(4A's and ranked 125th in the country out of more than 270,000 students)

MOOCs (on Coursera)

Machine Learning, Stanford University

Aug 2020, [verify](#)

Introduction to Tensorflow, DeepLearning.AI

Mar 2021, [verify](#)

Neural Networks and Deep Learning, DeepLearning.AI

Apr 2021, [verify](#)

Structuring Machine Learning Projects, DeepLearning.AI

May 2021, [verify](#)

Convolutional Neural Networks, DeepLearning.AI

May 2021, [verify](#)

Improving Deep Neural Networks, DeepLearning.AI

May 2021, [verify](#)

Selected Undergraduate Courses

Image Processing and Machine Vision

grade : A+

Machine Vision

grade : A+

Advances in Machine Vision

grade : A+

EXPERIENCE

MBZUAI, Abu Dhabi, UAE

Jul 2023 - Present

Research Assistant

Advisors : [Fahad Khan](#), [Muzammal Naseer](#)

- Completed research on language-tied visual representation learning for histopathology image analysis (paper accepted to MICCAI 2024 conference)
- Ongoing research on a Multi-lingual Large Multi Modal (MLMM) benchmark
- Ongoing research on a novel foundation model for medical images

University of Moratuwa, Sri Lanka & Harvard University, USA **Sep 2022 - Jun 2023**

Undergraduate Thesis Research Student (Remote Collaboration)

Advisors : [Dushan Wadduwage](#), [Chamira U. S. Edussooriya](#), [Ranga Rodrigo](#)

- Contrastive learning and uncertainty awareness for histopathology image analysis

University of Sydney, Australia

Jan 2022 - Aug 2022

Research Intern

Advisors : [Kanchana Thilakarathna](#), [Ming Ding](#)

- Spatial privacy preservation of 3D point cloud data using Machine Learning

PREPRINTS

[ACCEPTED TO MICCAI 2024] **Hasindri Watawana**, Kanchana Ranasinghe, Tariq Mahmood, Muzammal Naseer, Salman Khan, Fahad Shahbaz Khan : [Hierarchical Text-to-Vision Self Supervised Alignment for Improved Histopathology Representation Learning](#)

Nirhoshan Sivaroopan*, Chamuditha Jayanga*, Chalani Ekanayake*, **Hasindri Watawana***, Jathurshan Pradeepkumar, Mithunjha Anandakumar, Ranga Rodrigo, Chamira U. S. Edussooriya, Dushan N. Wadduwage (* denotes equal contribution) : [Contrastive Deep Encoding Enables Uncertainty Aware Machine Learning Assisted Histopathology](#)

INVITED TALKS **Information Security and Privacy group of Data61, CSIRO, Australia** **Jul 2022**
Privacy preserving representations of 3D point clouds [\[Presentation\]](#)

RESEARCH PROJECTS **Multimodal Learning for Histopathology Image Analysis** **Jul 2023 - Mar 2024**
Research Assistant at MBZUAI, Abu Dhabi [\[Code, arXiv\]](#)

- Developed a novel language-tied histopathology image representation learning framework that explores the inherent hierarchy in histopathology image and text data
- Leveraged a hierarchical vision contrastive loss and a text-to-vision alignment loss to achieve state-of-the-art in multiple downstream tasks
- Worked on brain tumor images from [OpenSRH dataset](#) and [TCGA dataset](#)

Uncertainty Aware Deep Encoding for Histopathology **Sep 2022 - Jun 2023**
Undergraduate Thesis Project [\[arXiv\]](#)

- Developed a self-supervised deep representation learning model for histopathology that assesses prediction uncertainty and achieves state-of-the-art (SOTA) in patch and slide level classification on [NCT-CRC-HE-100K](#) and [PCAM](#) datasets
- Our approach achieves SOTA with only 1-10% annotations compared to benchmark
- We introduce an uncertainty-aware annotation method that reaches SOTA with significantly fewer annotations compared to randomly selected annotation of data

Spatial Privacy of 3D Data in Extended Reality Domain [\[Presentation\]](#)
Research Intern at University of Sydney

- Researched on achieving privacy of 3D point cloud data using latent vector manipulations, Gaussian and Laplace mechanisms for differential privacy
- Utilised a privacy metric in quantifying and extracting a subset of privacy critical points to be perturbed with noise for privacy protection while maintaining utility
- Used [ModelNet](#) and [ShapeNet](#) datasets and my own dataset collected via HoloLens

Anomaly Detection Through Self-Aware Autonomous Systems **Jun 2021 - Aug 2021**
Team leader [\[Code, Presentation\]](#)

- Developed an unsupervised learning algorithm utilizing deep reconstruction and forecasting from IMU sensor data and camera images obtained from a ground vehicle
- Contribution : Developed a conditional GAN for next frame prediction using image dataset and used MSE between predicted and actual frames for anomaly detection

Thermal Environment Monitoring System for HEVs **Oct 2020 - Dec 2022**
Undergraduate Researcher

- Designed a solution for reduced Hybrid Electric Vehicle (HEV) battery lifetime in tropical countries by an external battery monitoring system
- Contribution: Developed a Machine Learning based model to predict battery parameters such as State of Health

Selected Undergraduate Projects

IoT based system implemented with NodeMCU, NodeRED [GitHub Repository](#)
Finite Impulse Response filter using MATLAB [GitHub Repository](#)
PID controlled line following robot [Project Report](#)

AWARDS

Won the [IEEE ICAS Student Challenge 2021 \(Announcement\)](#)
Top 10 best innovative ideas at [HackaDev Innovation Challenge 2020/21](#)
Class representative and a graduate of ScholarX Class of 2021
Awarded as a President Guide at the President Guide Awards 2016
Champion of the Inter School Best Speaker Contest (English) 2014

SKILLS

Languages: Python (Proficient), MATLAB
Frameworks: PyTorch, TensorFlow, Keras
Utilities: PyCharm, VSCode, Google Colab, Git

REFERENCES

Dr. Dushan N. Wadduwage
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Harvard University, USA
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Dr. Ranga Rodrigo
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