HASINDRI SANKALPANA WATAWANA

hasindri98.hsw@gmail.com GitHub LinkedIn Homepage

RESEARCH INTERESTS

Computer Vision, Machine Learning, Multimodal Learning, Histopathology 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
- Ongoing research on vision-language models for histopathology image analysis

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

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 - Present**
Research Assistant at MBZUAI, Abu Dhabi

- Developing a novel vision-language model for histopathology image representation learning using a limited set of dataset relevant visual attributes as text instead of per image captions
- Leveraging contrastive learning and knowledge distillation for self supervised learning
- Working 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
Research Intern at University of Sydney [Presentation]

- 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
John Harvard Distinguished Science Fellow in Imaging
Harvard University, USA
wadduwage@fas.harvard.edu

Dr. Ranga Rodrigo
Head of Department
Dept of Electronic & Telecom. Eng.
University of Moratuwa, Sri Lanka
ranga@uom.lk

Dr. Chamira Edussooriya
Senior Lecturer
Dept of Electronic & Telecom. Eng.
University of Moratuwa, Sri Lanka
chamira@uom.lk