OSHAN MUDANNAYAKE

Researcher

Computer Science

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Other   🎓 Google Scholar | K Kaggle | ⓖ GitHub | Ⓜ Medium | in LinkedIn

RESEARCH INTERESTS

Reinforcement Learning | Machine Learning | Artificial Intelligence

Game Theory | Computer Games

Computer Vision

EDUCATION

[Reading] University of Moratuwa   *Jan. 2023 - Present*

M.Sc in Data Science & AI

University of Colombo School of Computing   *Feb. 2016 - Feb. 2020*

B.Sc (Hons) in Computer Science

First Class Honors with a GPA of 3.61/4.0 (Top 5%)

Ranked 6th over 156 CS students

Thesis: *"Summarization of Large Scale Streaming Graphs"* (Grade A)

Positions: Chair of IEEE Student Branch, Core team member at Mozilla Club, Member at CompSoc, Instructor at Exploration Club, Batch representative at IUD

Maliyadeva College   *Jan. 2001 - Dec. 2014*

G.C.E. Advance Level Examination - Physical Science Stream

Positions: President of Robotics Club, Team Lead of Hardware and Networking Group

PUBLICATIONS

[1] **[Journal]** O. Mudannayake*, D. Rathnayake*, J. D. Herath, D. K. Fernando and M. Fernando, "Exploring Machine Learning and Deep Learning Approaches for Multi-Step Forecasting in Municipal Solid Waste Generation," in IEEE Access, vol. 10, pp. 122570-122585, 2022, [doi: 10.1109/ACCESS.2022.3221941].

[2] **[Conference]** O. Mudannayake and N. Ranasinghe, "kMatrix: A Space Efficient Streaming Graph Summarization Technique," 2021 10th International Conference on Information and Automation for Sustainability (ICIAfS), 2021, pp. 161-166, [doi: 10.1109/ICIAfS52090.2021.9606137].

* Equal contribution

ARTICLES IN REVIEW

[1] H. Samaranayake, **O. Mudannayake**, D. Perera, P. Kumarasinghe, C. Suduwella, K. De Zoysa and P. Wimalaratne, "Detecting Water In Visual Image Streams Captured From Unmanned Aerial Vehicles".

[2] **O. Mudannayake**, A. Indika and U. Jayasinghe, "Privacy Preserved Machine Learning using Secure Multi-party Computing: A Survey".

EXPERIENCE

Senior Data Science Engineer (Full-time)   *Nov. 2021 - Present*

WSO2   Sri Lanka

· Developed and deployed machine learning models to optimize performance and enhance functionality of software products.

· Collaborated with the product team to incorporate insights from machine learning algorithms into WSO2's core product offerings, resulting in increased customer engagement and sales.

· Developed and maintained custom data visualization dashboards for internal stakeholders, enabling faster and more effective decision-making.

· Contributed to the development and implementation of best practices for data science, including code documentation, version control, and model evaluation.

Research Assistant (Part-time) *May. 2021 - Present*

University of Colombo School of Computing Sri Lanka

· Advised by Dr. Noel Fernando

· Conducted research on solid waste generation patterns in cities using machine learning techniques, which involved collecting and analyzing time series data over a several decades.

· Developed and implemented machine learning models to forecast solid waste generation patterns, which improved the efficiency of waste management planning and resource allocation.

· Contributed to a publication on solid waste management in IEEE Access, which highlighted the research findings and their implications for waste management practices.

· Demonstrated a strong ability to work independently, manage time effectively, and prioritize tasks to meet project deadlines.

Data Science Engineer (Full-time) *Apr. 2021 - Oct. 2021*

WSO2 Sri Lanka

· Conducted exploratory data analysis to identify trends and patterns and made data-driven recommendations to improve business strategies.

· Presented findings and insights from data analyses to both technical and non-technical stakeholders.

· Collaborated with cross-functional teams to identify and define business problems, and developed solutions to meet business objectives.

Researcher (Part-time) *Aug. 2020 - Dec. 2021*

Sustainable Computing Research (SCoRe) Lab Sri Lanka

· Advised by Dr. Mohamed Nabeel

· Developed and implemented a machine learning-based approach to predict malicious domain URLs.

Software Engineer - IAM Team (Full-time) *Mar. 2020 - Mar. 2021*

WSO2 Sri Lanka

· Designed and implemented a new CORS architecture for Identity Server 5.11, improving security and enabling cross-origin resource sharing.

· Contributed to customer support efforts by providing timely and effective solutions to product issues, resulting in increased customer satisfaction and retention.

· Investigated the FIDO capabilities of Identity Server and proposed changes necessary for its adoption across the platform, enhancing the product's authentication capabilities.

· Worked on configuring Identity Server and propagating necessary configurations in tenanted URL mode, ensuring seamless and efficient operation across multiple tenants.

· Successfully managed and prioritized multiple projects simultaneously, ensuring on-time delivery.

· Proactively sought out new technologies and approaches to improve product performance and functionality.

Research Intern (Full-time) *Jul. 2018 - Jan. 2019*

University of Colombo School of Computing - Distributed Computing Group Sri Lanka

· Advised by Dr. Nalin Ranasinghe

· Successfully developed and implemented a new layer over Tensorflow to facilitate machine learning on encrypted data over a distributed network of machines, improving data security and privacy.

· Presented research findings at the SLASSCOM conference, demonstrating excellent communication and presentation skills.

Student Developer *May. 2018 - Aug. 2018*

CERN-HSF - Google Summer of Code Remote

Software Developer (Contract) *Jan. 2018 - Mar. 2020*

Language Matters Sri Lanka

· Supervised by Dr. Leonie Solomons

Software Developer (Contract) *Feb. 2016 - Jan. 2017*

Dreamteam IT Solutions Sri Lanka

· Supervised by Dr. Gihan Kuruppu

Course Instructor (Contract) *Jan. 2016 - Jun. 2016*
Dreamteam IT Solutions Sri Lanka

SCHOLARSHIPS & GRANTS

[1] AutoML Fall School Scholarship, 2021
[2] Dataquest & AI Inclusive Scholarship, 2021
[3] Tokyo Data Science Full Scholarship, 2020
[4] Commonwealth of Learning Coursera Scholarship by Commonwealth of Learning, Canada, 2020
[5] HackZurich Travel grant, 2019
[6] AI Summer School Singapore Scholarship[1], 2019
[7] ownCloud Conference Travel grant by CERN and ownCloud, 2018
[8] Hack the North Travel grant, 2018

HONOURS & AWARDS

[1] Merit Award at Datathon (SLIIT Codefest) by Sri Lanka Institute of Information Technology, 2019
[2] *IEEE Regional Exemplary Student Branch 2020 under Region 10 and Sri Lanka Section by IEEE, 2019
[3] *Bronze category winner of IEEE Darrel Chong Student Activity Award 2020 by IEEE, 2019
[4] *Best Student Branch Activity Award for GameRush at IEEE SLSYWC 2019 by IEEE, 2019
[5] 1st place at Codezilla by Mozilla Campus Club of Uva Wellassa University, 2018
[6] 1st place at LetMeHack by Sabaragamuwa University, 2018
[7] Award of Appreciation at University of Colombo School of Computing on recognizing the outstanding achievements in hackathons and coding competitions., 2017
[8] †Best Industry Collaborative Award at IEEE SLSYWC 2017 by IEEE, 2017
[9] ‡Best Student Branch Activity Award at IEEE SLSYWC 2017 by IEEE, 2017
[10] 2nd place at Presistent Hackathon by Persistent Systems Lanka, 2017
[11] 2nd place at HACKiNTRA by University of Jaffna, 2017
[12] Finalist at CodeFest Designathon by Sri Lanka Institute of Information Technology, 2017
[13] Finalist at SS12 Asia by IEEE, 2017
[14] 3rd place at Dialog Game Dev Hackathon by Dialog Axiata, 2017
[15] 1st place at Mozilla Web Maker Party by Mozilla Club of University of Colombo School of Computing, 2016
[16] 2nd place at CodeFest Tertiary Hackathon by Sri Lanka Institute of Information Technology, 2016
[17] 1st place at IEEE preXtreme 1.0 by IEEE Student Branch of University of Colombo School of Computing, 2016
[18] 6th place at ACES Coders by University of Peradeniya, 2016
[19] 5th place at Code Expertz by University of Moratuwa, 2016

* President of the IEEE Student Branch of UCSC
† Finance Team Lead of IEEE TAP project
‡ Program Team Lead of CloudHack 17 hackathon

POSTER PRESENTATIONS

[1] Machine Learning over Encrypted Data, Sri Lanka Association for the Advancement of Science (SLAAS) Exhibition, Sri Lanka, Dec. 2018

ORAL PRESENTATIONS

[1] kMatrix: A Space Efficient Streaming Graph Summarization Technique, IEEE ICIAfS, Sri Lanka, Jul. 2021

INVITED TALKS

[1] Invited speaker, Career guidance for undergraduates by UCSC ACM Student Chapter at University of Colombo School of Computing, Sri Lanka, 2021
[2] A new CORS Valve for the WSO2 Identity Server by IAM Community Call by WSO2 at WSO2, Sri Lanka, 2020
[3] Invited speaker, Rust 101 by Mozilla Club of UCSC at University of Colombo School of Computing, Sri Lanka, 2019
[4] Invited speaker, Lightning talk on Phoenix by ownCloud Conference 2018 at ownCloud GmbH, Germany, 2018

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[1]I did not accept this scholarship as I could not attend the event due to university examinations.

WORKSHOPS ATTENDED

[1] Online Asian Machine Learning School at 13th Asian Conference on Machine Learning, Nov. 2021
[2] AutoML Fall School, Nov. 2021
[3] ACM Europe Summer School on HPC Computer Architectures for AI and Dedicated Applications by Barcelona Supercomputing Center and Universitat Politècnica de Catalunya, Aug. 2021
[4] AI Summer School Singapore 2021, Jul. 2021
[5] Qiskit Global Summer School 2021: Quantum Machine Learning, Jul. 2021
[6] AI Summer School Singapore 2020, Aug. 2020

SELECTED PROJECTS

Realtime Property Evaluation of Large Streaming Graphs   Jan. 2019 - Jan. 2020
Graphs, Graph Summarization, Python
Developed a system for summarizing graph streams, addressing a significant problem in the field of large-scale graph analysis and demonstrating the potential of realtime property evaluation for large-scale graphs.

TessTA   Jan. 2018 - Mar. 2020
ML, OCR, React, Java, Spring Boot, Hibernate, Tesseract, AWS
Created an OCR solution for the Sinhala language utilizing the Tesseract OCR Engine.

Machine Learning over Encrypted Data   Jul. 2018 - Jan. 2019
ML, Encryption, Tensorflow, Python, Google Cloud Platform
Worked on developing a layer over Tensorflow that enabled machine learning on encrypted data across a distributed network of machines.

Intelligent Traffic Light System   Feb. 2017 - Nov. 2017
Tensorflow, Python, Angular, NodeJS, Raspberry Pi, Arduino, Ionic Framework, GCP
Automated a traditional time interval based traffic light system to improve traffic management by removing the need for traffic officers and replacing the round robin light schedule with an adaptive system.

Bra Elasticity Analyzing System   Mar. 2016 - Jan. 2017
Image processing, OpenCV, Java, Swing
Developed a method for comparing the elasticity of sports bras using image processing.

Yarn Detection System   Mar. 2016 - Jan. 2017
Image processing, OpenCV, Python, Raspberry Pi
Developed a solution to detect the knots in yarn threads used in glove weaving machines, resulting in significant savings of hundreds of needles wasted per day and reduced hours of manpower.

Glove Defect Identification System   Jan. 2016 - Jun. 2016
Image processing, OpenCV, Python
Utilized image processing to identify common defects in gloves as they were being conveyed on a conveyor belt, enabling the automatic rejection of defective gloves without human intervention, and automating the entire pipeline.

Smart Glove   Jan. 2016 - Jun. 2016
Java, JavaFX, FSR 400, Arduino
Designed a glove prototype that measures the pressure distribution and acceleration of the hand to derive optimal patterns of movement for cricket players, taking into account the hand pressure.

CERTIFICATIONS

[1] Advanced Machine Learning on Google Cloud Specialization by Coursera, 2021
[2] Data Engineering, Big Data, and Machine Learning on GCP Specialization by Coursera, 2021
[3] Machine Learning on Google Cloud Specialization by Coursera, 2021
[4] Deep Learning Specialization by Coursera, 2020
[5] Natural Language Processing Specialization by Coursera, 2020
[6] DeepLearning.AI TensorFlow Developer Specialization by Coursera, 2020
[7] Generative Adversarial Networks (GANs) Specialization by Coursera, 2020
[8] Qwicklabs quests on ML and Data Science -by Qwicklabs, 2020
[9] Oracle Certified Professional Java SE 6 Programmer by Oracle, 2015
[10] Robotics & Automation by Dreamteam IT Solutions, 2015

[11] Professional Certified Java Developer by Dreamteam IT Solutions, 2015

[12] Diploma in Software Engineering by Esoft, 2013

[13] Diploma in PC Hardware and Network Administration by Esoft, 2010

TECHNICAL SKILLS

Computer Languages	Python, Java, C
Numerical Computing	MATLAB, Octave, Numpy
ML	Scikit, Tensorflow
ML Packages	Darts
Image Processing	OpenCV
Databases	MySQL, MongoDB, Redis
Cloud Platforms	GCP, AWS
Other	Linux, Git, Jupyter Notebook

MENTORING

[1] Mentor at SCoRe Lab in Google Summer of Code, 2019, 2020, 2021, 2022, 2023

[2] Mentor at ReidCon by UCSC, 2021

[5] Mentor at SCoRe Lab in Google Code-In, 2016, 2017, 2018

[6] Mentor at 2nd Year Group Project Mentoring by IEEE Student Branch of UCSC, 2018

[8] Question Panel Member - preXtreme 2.0 - IEEE Student Branch of UCSC, 2017

[9] Mentor at International School Software Competition (ISSC) by Computer Society of Sri Lanka, 2017

[10] Mentor at Help to Code by Information and Communication Technology Agency of Sri Lanka, 2017

[12] Mentor at National School Software Competition (NSSC) by Computer Society of Sri Lanka, 2016

COMMITTEE POSITIONS

[1] Judge panel member at IEEE YESIST12 2021 Junior Einstein Track by IEEE, 2021

[2] Judge panel member (Machine Learning) at MadHack by IEEE Student Branch of UCSC, 2021

[3] Core Team Member at Google Developer Group (GDG) Sri Lanka, 2019

[4] President of IEEE Student Branch of UCSC, 2019

[5] Team Lead at Mozilla activate Sri Lanka - Rust Team, 2019

[6] Web Master of IEEE Sri Lanka Section - Student activity Committee (SAC), 2018

[7] Secretary of IEEE Student branch of UCSC, 2018

[8] Operational Committee Member at Mozilla Activate Sri Lanka, 2018

[9] Android Developer at Global Geek Sustainable Learning Kingdom (GGSLK) Sri Lanka, 2018

[10] Operational Committee Member at Program Team - IEEE Student/YP/WIE Congress, 2017

[11] Finance Team Lead at Technological Awareness Project by IEEE Sri Lanka Section, 2017

[12] Program Team Lead at CloudHack 17 by IEEE Student Branch of UCSC, 2017

[13] Core Team Member at Mozilla Club UCSC, 2017

[14] Coordinator at IEEE Student Branch of UCSC, 2017

[15] Operational Committee Member at Finance Team - Innover (IEEE IAS IOT Workshop), 2016

[16] Operational Committee Member at Program Team - IEEE Day UCSC, 2016

[17] Instructor at UCSC Exploration Club, 2016

[18] President of Robotics Club at Maliyadeva College, 2012, 2013

REFERENCES

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