# OSHAN MUDANNAYAKE

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## 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

**[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].

**[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

## 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

2021 - AutoML Fall School Scholarship
2021 - Dataquest & AI Inclusive Scholarship
2020 - Tokyo Data Science Full Scholarship
2020 - Commonwealth of Learning Coursera Scholarship by Commonwealth of Learning, Canada
2019 - HackZurich Travel grant

2019 - AI Summer School Singapore Scholarship[1]
2018 - ownCloud Conference Travel grant by CERN and ownCloud
2018 - Hack the North Travel grant

## HONOURS & AWARDS

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

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

## INVITED TALKS

Jul. 2021 - *kMatrix: A Space Efficient Streaming Graph Summarization Technique - IEEE ICIAfS 2021
May. 2021 - Career guidance for undergraduates - UCSC ACM Student Chapter
Dec. 2020 - A new CORS Valve for the WSO2 Identity Server - IAM Community Call by WSO2
Oct. 2019 - Rust 101 - Hacktoberfest 2019 by Mozilla Club of UCSC
Dec. 2018 - †Machine Learning over Encrypted Data - Sri Lanka Association for the Advancement of Science (SLAAS) Exhibition 2018
Sep. 2018 - Lightning talk on Phoenix - ownCloud Conference 2018

* Research conference presentation
† Poster presentation

## WORKSHOPS ATTENDED

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

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

## 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

2021 - Advanced Machine Learning on Google Cloud Specialization by Coursera
2021 - Data Engineering, Big Data, and Machine Learning on GCP Specialization by Coursera
2021 - Machine Learning on Google Cloud Specialization by Coursera
2020 - Deep Learning Specialization by Coursera
2020 - Natural Language Processing Specialization by Coursera
2020 - DeepLearning.AI TensorFlow Developer Specialization by Coursera
2020 - Generative Adversarial Networks (GANs) Specialization by Coursera
2020 - Qwicklabs quests on ML and Data Science -by Qwicklabs
2015 - Oracle Certified Professional Java SE 6 Programmer by Oracle
2015 - Robotics & Automation by Dreamteam IT Solutions
2015 - Professional Certified Java Developer by Dreamteam IT Solutions
2013 - Diploma in Software Engineering by Esoft
2010 - Diploma in PC Hardware and Network Administration by Esoft

## 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

2021 - Mentor at ReidCon by UCSC

2021 - Mentor at SCoRe Lab in Google Summer of Code 2021

2020 - Mentor at SCoRe Lab in Google Summer of Code 2020

2019 - Mentor at SCoRe Lab in Google Summer of Code 2019

2018 - Mentor at SCoRe Lab in Google Code-In 2018

2018 - Mentor at 2nd Year Group Project Mentoring by IEEE Student Branch of UCSC

2017 - Mentor at SCoRe Lab in Google Code-In 2017

2017 - Question Panel Member - preXtreme 2.0 - IEEE Student Branch of UCSC

2017 - Mentor at International School Software Competition (ISSC) by Computer Society of Sri Lanka

2017 - Mentor at Help to Code by Information and Communication Technology Agency of Sri Lanka

2016 - Mentor at SCoRe Lab in Google Code-In 2016

2016 - Mentor at National School Software Competition (NSSC) by Computer Society of Sri Lanka

## COMMITTEE POSITIONS

2021 - Judge panel member at IEEE YESIST12 2021 Junior Einstein Track by IEEE

2021 - Judge panel member (Machine Learning) at MadHack by IEEE Student Branch of UCSC

2019 - Core Team Member at Google Developer Group (GDG) Sri Lanka

2019 - President of IEEE Student Branch of UCSC 2019 - Team Lead at Mozilla activate Sri Lanka - Rust Team

2018 - Web Master of IEEE Sri Lanka Section - Student activity Committee (SAC)

2018 - Secretary of IEEE Student branch of UCSC

2018 - Operational Committee Member at Mozilla Activate Sri Lanka

2018 - Android Developer at Global Geek Sustainable Learning Kingdom (GGSLK) Sri Lanka

2017 - Operational Committee Member at Program Team - IEEE Student/YP/WIE Congress

2017 - Finance Team Lead at Technological Awareness Project by IEEE Sri Lanka Section 2017 - Program Team Lead at CloudHack 17 by IEEE Student Branch of UCSC 2017 - Core Team Member at Mozilla Club UCSC

2017 - Coordinator at IEEE Student Branch of UCSC

2016 - Operational Committee Member at Finance Team - Innover (IEEE IAS IOT Workshop)

2016 - Operational Committee Member at Program Team - IEEE Day UCSC

2016 - Instructor at UCSC Exploration Club

2013 - President of Robotics Club at Maliyadeva College

2012, 2013 - Team Lead at Hardware and Networking Team at Maliyadeva College

## REFERENCES

**Prof. MGNAS Fernando**
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