



# OSHAN MUDANNAYAKE

Researcher  
Computer Science

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Email [oshan.ivantha@gmail.com](mailto:oshan.ivantha@gmail.com) | [osh@ucsc.cmb.ac.lk](mailto:osh@ucsc.cmb.ac.lk)  
Website [ivantha.com](http://ivantha.com)  
Other  [Google Scholar](#) |  [Kaggle](#) |  [GitHub](#) |  [Medium](#) |  [LinkedIn](#)

## RESEARCH INTERESTS

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Reinforcement Learning | Machine Learning | Artificial Intelligence  
Game Theory  
Computer Vision  
Computer Games

## EDUCATION

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**[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 6<sup>th</sup> 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

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- [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](https://doi.org/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](https://doi.org/10.1109/ICIAfS52090.2021.9606137)].

\* Equal contribution

## ARTICLES IN REVIEW

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- [1] H. Samaranyake, 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”.
- [3] O. Mudannayake, K. Senarathne, S. Farook, L. De Mel, and C. Jayanaka, “Leveraging Spatial and Temporal Data for Enhanced Wildfire Spread Prediction”.

## EXPERIENCE

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**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*

## SCHOLARSHIPS & GRANTS

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- [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<sup>1</sup>, 2019
- [7] ownCloud Conference Travel grant by CERN and ownCloud, 2018
- [8] Hack the North Travel grant, 2018

## HONOURS & AWARDS

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- [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] 1<sup>st</sup> place at Codezilla by Mozilla Campus Club of Uva Wellassa University, 2018
- [6] 1<sup>st</sup> 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] 2<sup>nd</sup> place at Persistent Hackathon by Persistent Systems Lanka, 2017
- [11] 2<sup>nd</sup> 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] 3<sup>rd</sup> place at Dialog Game Dev Hackathon by Dialog Axiata, 2017
- [15] 1<sup>st</sup> place at Mozilla Web Maker Party by Mozilla Club of University of Colombo School of Computing, 2016
- [16] 2<sup>nd</sup> place at CodeFest Tertiary Hackathon by Sri Lanka Institute of Information Technology, 2016
- [17] 1<sup>st</sup> place at IEEE preXtreme 1.0 by IEEE Student Branch of University of Colombo School of Computing, 2016
- [18] 6<sup>th</sup> place at ACES Coders by University of Peradeniya, 2016
- [19] 5<sup>th</sup> 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

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

## ORAL PRESENTATIONS

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

## INVITED TALKS

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- [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

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<sup>1</sup>I did not accept this scholarship as I could not attend the event due to university examinations.

- [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

## WORKSHOPS ATTENDED

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- [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

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- 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

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- [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

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

## MENTORING

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- [1] Mentor at SCoRe Lab in Google Summer of Code, 2019, 2020, 2021, 2022
- [2] Mentor at ReidCon by UCSC, 2021
- [3] Mentor at SCoRe Lab in Google Code-In, 2016, 2017, 2018
- [4] Mentor at 2nd Year Group Project Mentoring by IEEE Student Branch of UCSC, 2018
- [5] Question Panel Member - preXtreme 2.0 - IEEE Student Branch of UCSC, 2017
- [6] Mentor at International School Software Competition (ISSC) by Computer Society of Sri Lanka, 2017
- [7] Mentor at Help to Code by Information and Communication Technology Agency of Sri Lanka, 2017
- [8] Mentor at National School Software Competition (NSSC) by Computer Society of Sri Lanka, 2016

## COMMITTEE POSITIONS

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- [1] Judge panel member (Area: ML) at IntelliHack by IEEE CS Chapter of UCSC, 2023
- [2] Judge panel member at IEEE YESIST12 2021 Junior Einstein Track by IEEE, 2021
- [3] Judge panel member (Area: ML) at MadHack by IEEE Student Branch of UCSC, 2021
- [4] Core Team Member at Google Developer Group (GDG) Sri Lanka, 2019
- [5] President of IEEE Student Branch of UCSC, 2019
- [6] Team Lead at Mozilla activate Sri Lanka - Rust Team, 2019
- [7] Web Master of IEEE Sri Lanka Section - Student activity Committee (SAC), 2018
- [8] Secretary of IEEE Student branch of UCSC, 2018
- [9] Operational Committee Member at Mozilla Activate Sri Lanka, 2018
- [10] Android Developer at Global Geek Sustainable Learning Kingdom (GGSLK) Sri Lanka, 2018
- [11] Operational Committee Member at Program Team - IEEE Student/YP/WIE Congress, 2017
- [12] Finance Team Lead at Technological Awareness Project by IEEE Sri Lanka Section, 2017
- [13] Program Team Lead at CloudHack 17 by IEEE Student Branch of UCSC, 2017
- [14] Core Team Member at Mozilla Club UCSC, 2017
- [15] Coordinator at IEEE Student Branch of UCSC, 2017
- [16] Operational Committee Member at Finance Team - Innover (IEEE IAS IOT Workshop), 2016
- [17] Operational Committee Member at Program Team - IEEE Day UCSC, 2016
- [18] Instructor at UCSC Exploration Club, 2016
- [19] President of Robotics Club at Maliyadeva College, 2012, 2013