

# OSHAN MUDANNAYAKE

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## RESEARCH INTERESTS

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

## EDUCATION

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### 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)

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

### Maliyadeva College

Jan. 2001 - Dec. 2014

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

- President of Robotics Club
- Team Lead of Hardware and Networking Group

## RESEARCH EXPERIENCE

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### Research Assistant (Part-time)

May. 2021 - Present

*University of Colombo School of Computing*

Sri Lanka

- Advisor: Dr. Noel Fernando
- Working on modeling and prediction of municipal solid waste generation in Sri Lanka using machine learning techniques.

### Researcher (Part-time)

Aug. 2020 - Present

*Sustainable Computing Research (SCoRe) Lab*

Sri Lanka

- Advisor: Dr. Mohamed Nabeel
- Working on machine learning based internet domain entity matching and its applications.

### Research Intern (Full-time)

Jul. 2018 - Jan. 2019

*University of Colombo School of Computing - Distributed Computing Group*

Sri Lanka

- Advisor: Dr. Nalin Ranasinghe
- Carried out a research study on the topic, Machine Learning Over Encrypted Data.

**Software Developer (Contract)**

Jan. 2018 - Mar. 2020

*Language Matters*

Sri Lanka

- Supervisor: Dr. Leonie Solomons
- Working part time on developing an OCR solution for Sinhala language using Tesseract OCR Engine.

**Software Developer (Contract)**

Feb. 2016 - Jan. 2017

*Dreamteam IT Solutions*

Sri Lanka

- Supervisor: Dr. Gihan Kuruppu
- Provided R&D solutions to industrial problems such as Bra Elasticity Analyzing System, Yarn Detection System and Glove Defect Identification System.

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**TEACHING EXPERIENCE****Course Instructor (Contract)**

Jan. 2016 - Jun. 2016

*Dreamteam IT Solutions*

Sri Lanka

- Conducted sessions for introductory robotics and Java 6.

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**PROFESSIONAL EXPERIENCE****Senior Data Science Engineer (Full-time)**

Nov. 2021 - Present

*WSO2*

Sri Lanka

**Data Science Engineer (Full-time)**

Apr. 2021 - Oct. 2021

*WSO2*

Sri Lanka

- Improved the HR aspects of the company by introducing a model to predict the workforce requirement in the coming years.

**Software Engineer - IAM Team (Full-time)**

Mar. 2020 - Mar. 2021

*WSO2*

Sri Lanka

- Designed and implemented the new CORS architecture for the Identity Server 5.11.
- Worked extensively on customer support in order to give solutions for the product issues.

**Student Developer**

May. 2018 - Aug. 2018

*CERN-HSF - Google Summer of Code*

Remote

- Worked as a Google Summer of Code Participant in collaboration with *CERN-HSF*, *ownCloud* and *AARNet* to provide a prototype of a new web UI for CERNBox that will provide an immersive user experience.

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**PUBLICATIONS**

[Conference] **Oshan Mudannayake**, Nalin Ranasinghe, "kMatrix: A Space Efficient Streaming Graph Summarization Technique", in *10th IEEE International Conference on Information and Automation for Sustainability (ICIAfS) 2021*, Colombo, Sri Lanka, Aug. 2021. [DOI: 10.1109/ICIAfS52090.2021.9606137].

[Preprint] **Oshan Mudannayake**, Disni Rathnayake, Jerome Dinal Herath, Dinuni K Fernando, MG-NAS Fernando, "Exploring Machine Learning and Deep Learning Approaches for Multi-Step Forecasting in Municipal Solid Waste Generation", Submitted to *Waste management*. [PDF].

## SELECTED PROJECTS

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### **Realtime Property Evaluation of Large Streaming Graphs** Jan. 2019 - Jan. 2020

*Graphs, Graph Summarization, Python*

Final year research project carried on the area of massive streaming graph summarization.

### **TessTA** Jan. 2018 - Mar. 2020

*ML, OCR, React, Java, Spring Boot, Hibernate, Tesseract, AWS*

OCR Solution for Sinhala language using Tesseract OCR Engine.

### **Machine Learning over Encrypted Data** Jul. 2018 - Jan. 2019

*ML, Encryption, Tensorflow, Python, Google Cloud Platform*

I worked on adding a layer over Tensorflow to facilitate machine learning on encrypted data over a distributed network of machines.

### **Intelligent Traffic Light System** Feb. 2017 - Nov. 2017

*Tensorflow, Python, Angular, NodeJS, Raspberry Pi, Arduino, Ionic Framework, GCP*

Traditional time interval based traffic light system was automated to remove the involvement of traffic officers.

### **Bra Elasticity Analyzing System** Mar. 2016 - Jan. 2017

*Image processing, OpenCV, Java, Swing*

Implemented a way to compare the elasticity of sports bras using image processing.

### **Yarn Detection System** Mar. 2016 - Jan. 2017

*Image processing, OpenCV, Python, Raspberry Pi*

Solution to detect the knots of yarn threads in glove weaving machines.

### **Glove Defect Identification System** Jan. 2016 - Jun. 2016

*Image processing, OpenCV, Python*

Identified the common defect of gloves using image processing as they are being passed through a conveyor belt.

### **Smart Glove** Jan. 2016 - Jun. 2016

*Java, JavaFX, FSR 400, Arduino*

A glove prototype that can measure the pressure distribution and the acceleration of hand in order to derive the best patterns of movements for Cricket players in relation with the hand pressure.

## MOOC CERTIFICATIONS

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- 2021 - Advanced Machine Learning on Google Cloud Specialization - Coursera
- 2021 - Data Engineering, Big Data, and Machine Learning on GCP Specialization - Coursera
- 2021 - Machine Learning on Google Cloud Specialization - Coursera
- 2020 - Deep Learning Specialization - Coursera
- 2020 - Natural Language Processing Specialization - Coursera
- 2020 - DeepLearning.AI TensorFlow Developer Specialization - Coursera
- 2020 - Generative Adversarial Networks (GANs) Specialization - Coursera
- 2020 - Qwicklabs quests on ML and Data Science - Qwicklabs

## PROFESSIONAL CERTIFICATIONS

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- 2015 - Oracle Certified Professional Java SE 6 Programmer - Oracle

- 2015 - Robotics & Automation - Dreamteam IT Solutions
- 2015 - Professional Certified Java Developer - Dreamteam IT Solutions
- 2013 - Diploma in Software Engineering - Esoft
- 2010 - Diploma in PC Hardware and Network Administration - Esoft

## ACHIEVEMENTS

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- 2019 - Merit Award - Datathon (SLIIT Codefest) by Sri Lanka Institute of Information Technology
- 2018 - 1<sup>st</sup> place - Codezilla by Mozilla Campus Club of Uva Wellassa University
- 2018 - 1<sup>st</sup> place - LetMeHack by Sabaragamuwa University
- 2019 - Participant - HackZurich by Digital Festival
- 2018 - Participant - Hack The North by University of Waterloo
- 2017 - 2<sup>nd</sup> place - Persistent Hackathon by Persistent Systems Lanka
- 2017 - 2<sup>nd</sup> place - HACKiNTRA by University of Jaffna
- 2017 - Finalist - CodeFest Designathon by Sri Lanka Institute of Information Technology
- 2017 - Finalist - SS12 Asia by IEEE
- 2017 - 3<sup>rd</sup> place - Dialog Game Dev Hackathon by Dialog Axiata
- 2016 - 1<sup>st</sup> place - Mozilla Web Maker Party by Mozilla Club of University of Colombo School of Computing
- 2016 - 2<sup>nd</sup> place - CodeFest Tertiary Hackathon by Sri Lanka Institute of Information Technology
- 2016 - 1<sup>st</sup> place - IEEE preXtreme 1.0 by IEEE Student Branch of University of Colombo School of Computing
- 2016 - 6<sup>th</sup> place - ACES Coders by University of Peradeniya
- 2016 - 5<sup>th</sup> place - Code Expertz by University of Moratuwa

## SCHOLARSHIPS & GRANTS

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- 2021 - AutoML Fall School Scholarship - AutoML Fall School
- 2021 - Dataquest & AI Inclusive Scholarship - Dataquest
- 2020 - Tokyo Data Science Full Scholarship - Tokyo Data Science
- 2020 - Commonwealth of Learning Coursera Scholarship - Commonwealth of Learning, Canada
- 2019 - HackZurich Travel grant - Digital Festival
- 2019 - AI Summer School Singapore Scholarship<sup>1</sup> - AI Singapore
- 2018 - ownCloud Conference Travel grant - CERN & ownCloud
- 2018 - Hack the North Travel grant

## HONOURS & AWARDS

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- 2017 - Award of Appreciation - University of Colombo School of Computing - Special award on recognizing the outstanding achievements in hackathons and coding competitions.

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

## WORKSHOPS / TRAINING PROGRAMS ATTENDED

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- Nov. 2021 - Online Asian Machine Learning School (OAMLS) - The 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 - Barcelona Supercomputing Center and Universitat Politècnica de Catalunya
- Aug. 2021 - AI Summer School Singapore 2021 - AI Singapore
- Jul. 2021 - Qiskit Global Summer School 2021: Quantum Machine Learning - Qiskit
- Aug. 2020 - AI Summer School Singapore 2020 - AI Singapore

## PRESENTATIONS

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- Jul. 2021 - [Conference] kMatrix: A Space Efficient Streaming Graph Summarization Technique - IEEE International Conference on Information and Automation for Sustainability 2021
- Dec. 2018 - [Poster] Machine Learning over Encrypted Data - Sri Lanka Association for the Advancement of Science (SLAAS) Exhibition 2018

## SEMINARS

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- May. 2021 - Career guidance for undergraduates - UCSC ACM Student Chapter - Colombo, Sri Lanka
- Dec. 2020 - A new CORS Valve for the WSO2 Identity Server - IAM Community Call by WSO2 - Colombo, Sri Lanka
- Oct. 2019 - Rust 101 - Hacktoberfest 2019 by Mozilla Club of UCSC - Colombo, Sri Lanka
- Sep. 2018 - Lightning talk on Phoenix - ownCloud Conference 2018 - Nuremberg, Germany

## TECHNICAL SKILLS

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<b>Computer Languages</b>	Python, Java, C
<b>Numerical Computing</b>	MATLAB, Octave, Numpy
<b>Scientific Computing</b>	Scikit
<b>ML Frameworks</b>	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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- 2021 - Mentor - ReidCon by UCSC
- 2021 - Mentor at SCoRe Lab - Google Summer of Code 2021
- 2020 - Mentor at SCoRe Lab - Google Summer of Code 2020
- 2019 - Mentor at SCoRe Lab - Google Summer of Code 2019
- 2018 - Mentor at SCoRe Lab - Google Code-In 2018
- 2018 - Mentor - 2nd Year Group Project Mentoring by IEEE Student Branch of UCSC

- 2017 - Mentor at SCoRe Lab - Google Code-In 2017
- 2017 - Question Panel Member - preXtreme 2.0 - IEEE Student Branch of UCSC
- 2017 - Mentor - International School Software Competition (ISSC) by Computer Society of Sri Lanka
- 2017 - Mentor - Help to Code by Information and Communication Technology Agency of Sri Lanka
- 2016 - Mentor at SCoRe Lab - Google Code-In 2016
- 2016 - Mentor - National School Software Competition (NSSC) by Computer Society of Sri Lanka

## COMMITTEE POSITIONS

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- 2021 - Judge panel member - IEEE YESIST12 2021 Junior Einstein Track by IEEE
- 2021 - Judge panel member (Machine Learning) - MadHack by IEEE Student Branch of UCSC
- 2019 - Present - Core Team Member - Google Developer Group (GDG) Sri Lanka
- 2019 - President - IEEE Student Branch of UCSC
  - **[Award]** IEEE Regional Exemplary Student Branch 2020 under Region 10 and Sri Lanka Section
  - **[Award]** Bronze category winner of IEEE Darrel Chong Student Activity Award 2020
  - **[Award]** Best Student Branch Activity Award for GameRush at IEEE SLSYWC 2019
- 2019 - Team Lead - Mozilla activate Sri Lanka - Rust Team
- 2018 - Web Master - IEEE Sri Lanka Section - Student activity Committee (SAC)
- 2018 - Secretary - IEEE Student branch of UCSC
- 2018 - Operational Committee Member - Mozilla Activate Sri Lanka
- 2018 - Android Developer - Global Geek Sustainable Learning Kingdom (GGSLK) Sri Lanka
- 2017 - Operational Committee Member - Program Team - IEEE Student/YP/WIE Congress
- 2017 - Finance Team Lead - Technological Awareness Project by IEEE Sri Lanka Section
  - **[Award]** Best Industry Collaborative Award at IEEE SLSYWC 2017
- 2017 - Program Team Lead - CloudHack 17 by IEEE Student Branch of UCSC
  - **[Award]** Best Student Branch Activity Award at IEEE SLSYWC 2017
- 2017 - Core Team Member - Mozilla Club UCSC
- 2017 - Coordinator - IEEE Student Branch of UCSC
- 2016 - Operational Committee Member - Finance Team - Innover (IEEE IAS IOT Workshop)
- 2016 - Operational Committee Member - Program Team - IEEE Day UCSC
- 2016 - Instructor - UCSC Exploration Club
- 2013 - President - Robotics Club - Maliyadeva College
- 2012, 2013 - Team Lead - Hardware and Networking Team - Maliyadeva College

## REFERENCES

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**Nalin Ranasinghe**

Ph.D (Cardiff)

*Senior Lecturer at UCSC*

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