Gayashan Amarasinghe

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About Me

> Experienced software engineer with 4+ years of expertise in integration and cloud solutions, with a passion for developing robust scalable solutions

> Consultant with client-facing experience, designing enterprise systems for the public sector across various organizational levels and domains

> Currently pursuing AWS Solutions Architect - Associate certification

> Holds a PhD specializing in resource scheduling for applications running on edge-cloud infrastructure, with a track record of pragmatic research and development

> Enthusiastic to contribute skills in engineering, specializing in software development, cloud, and integration

Skills

Programming	>	Python, Java, C++, Dart, Bash
Cloud/DevOps	>	AWS (Elastic Beanstalk, Lambda, SQS, SNS, S3, Step Functions, CodePipeline, Route 53, API Gateway, Cognito, CloudFormation, IAM), Kubernetes, Docker, IaC, Git
Data	>	SQL (MySQL, PostgreSQL, SQLite), NoSQL (MongoDB, Cloud Firestore)
Frameworks/SDKs	>	Flask, Django, Flutter, Hyperledger Fabric, Apache Storm, Apache Beam, Apache Spark, Apache Kafka
Tools	>	Poetry, PyPI, Maven, Gradle
Solution Design	>	Microservices, RESTful APIs, Enterprise Integration Patterns, ERD, SOA, OOSD
Delivery	>	Agile/Scrum, CI/CD, TDD, SDLC

Employment History

Jan 2023 – Present	>	**Software Engineer** RMIT University, Melbourne, Australia.
Jun 2021 – Jan 2023	>	**Senior Lecturer** Dept. of Computer Science and Engineering, University of Moratuwa, Sri Lanka.
Jun 2020 – Dec 2020	>	**Research Fellow** RMIT University, Melbourne, Australia.
Oct 2019 – Dec 2019	>	**Research Officer** RMIT University, Melbourne, Australia.
Jun 2015 – Jun 2021	>	**Lecturer** Dept. of Computer Science and Engineering, University of Moratuwa, Sri Lanka.
Mar 2014 – May 2015	>	**Software Engineer** WSO2 Inc., Sri Lanka.
Jun 2012 – Dec 2012	>	**Trainee Software Engineer** KISTERS AG, Aachen, Germany.

Education

2017 – 2021	>	**PhD**, The University of Melbourne, Melbourne, Australia. Thesis: *Distributed Data Stream Processing and Task Placement on Edge-Cloud Infrastructure* – Designed and developed novel algorithms to optimise the deployment of data stream processing ETL pipelines and low latency applications on cloud and edge computing infrastructure, using constraint satisfaction solvers, integer linear programming, and Markov models.
2009 – 2014	>	**B.Sc. Eng. (Hons.), Computer Science and Engineering** University of Moratuwa, Sri Lanka. – First Class Honours with GPA of 3.94/4.2, Class Rank 3/100

Experience/Noteworthy Projects

Software Engineering

RMIT BIPV Enabler
> Lead the BIPV Enabler development team - design, develop and deploy BIPV Enabler, a Building-integrated Photovoltaic modelling software for construction industry. BIPV Enabler consists of a Python workbench running on FreeCAD and a set of RESTful APIs developed using Flask running on AWS (CodePipeline, Beanstalk), secured using Cognito user pools/Lambda triggers, and managed using API Gateway.
> – **Tools:** Python, Flask, FreeCAD Python workbenches, AWS Elastic Beanstalk, CodePipeline, API Gateway, Cognito, Lambda, CloudFormation

WSO2 Carbon Kernel
> Designed, developed, and tested solutions using Java as a software engineer for WSO2 Carbon Kernel (core platform for the WSO2 ESB, API Manager) and WSO2 Application Server projects. Implemented the Log4j 2 upgrade. Optimized the distributed caching.
> – **Tools:** Java, OSGi, SOA, maven, Log4j, hazelcast

Blockchain solutions
> Designed and developed a proof-of-concept procurement management solution for construction industry based on a permissioned blockchain platform using Hyperledge Fabric. Designed the architecture of the solution. Developed the smart contracts.
> – **Tools:** Hyperledger Fabric, Java, smart contracts, Docker

ECSNeT++ simulator
> Designed and developed a simulation toolkit for simulating the execution of distributed stream processing applications on edge and cloud computing environments (an outcome of my doctoral studies). Open source and publicly available.
> – **Tools:** C++, OMNeT++, discrete event simulation, multivariate analysis

Dragon
> Designed and developed the topology embedding algorithms for the lightweight Dragon stream processing engine. Open source and publicly available.
> – **Tools:** Stream processing, real-time processing, Java, maven, private cloud deployment

MCQAutoGrader
> Designed and developed a tool used for automated grading of paper based MCQ examinations.
> – Used in production as part of the grading workflow at University of Moratuwa and has been estimated to result in cost savings of 1M LKR p.a..
> – **Tools:** Python, Poetry, NumPy, OMR, OpenCV, image processing, GitHub actions

KISTERS AG
> Implemented as a trainee software engineer a MOD4 protocol driver in C++ for a Wide Area Sensor Network that monitors the air quality.
> – **Tools:** C++

Consultancy/Customer Support

External Consultant
> Member of the consultancy team that conducted the reviewing of designing, upgrading, and UAT of Revenue Administration Management Information System (RAMIS) 3.0 - Internal Revenue Department of Sri Lanka. Signed off UAT.

> Member of the consultancy team that conducted the feasibility study for Data Center upgrade (to Tier III) for the Internal Revenue Department of Sri Lanka. Completed initial review and provided the plan for upgrading from current Tier I state.

> Member of the consultancy team that conducted the requirement gathering and reviewing of the Revenue Administration System for Excise Department (RASED) for the Excise Department of Sri Lanka.

WSO2 Support
> Developed the business process workflow with service endpoints and human tasks for the United Utilities to analyze the impact of OpenWater act. Conducted onsite in UK.

> Provided deployment and software support for clients such as Boeing, eBay, and more.

Leadership

CERN Collaboration
> A key member in establishing the ongoing research collaboration between University of Moratuwa and the ALICE experiment of CERN (The European Organization for Nuclear Research), Switzerland. Visited CERN on invitation to establish the collaboration.
> – Oversee two collaborative projects on improving the massive data processing applications of ALICE (A Large Ion Collider Experiment).

Experience/Noteworthy Projects (continued)

Learning analytics
> Oversee the project on using analytics for early detection of poor performing students based on real world data.
> **– Data:** Anonymized historical student grades, performance, and demographical data from undergraduates of University of Moratuwa (2013 to 2016).
> **– Tools:** ML, Python, scikit-learn, pandas, NumPy, Seaborn

Automated grading
> Initiated and led the project from 2016 on establishing automated code grading tools and workflow for the Moodle learning management system.
> – This project has directly helped to deliver programming courses to large undergraduate classes (≈ 1000) and increase the undergraduate intakes of Faculty of Engineering.
> – The project also helped to implement the open.uom.lk platform with automated grading (currently used by more than ≈ 100000 students).

Misc.

Workshops
> Organizer and resource person for two workshop series conducted on integrating ICT into pedagogy at Eastern University and University of Colombo.

Teaching
> Distributed Systems, Database Systems, Programming Fundamentals, Software Engineering, Software Architecture and Design, Cloud Technologies, Software Development on Cloud

Awards and Achievements

2022
> **Excellence Award**, awarded first position at the 21st European Conference on e-Learning for the open.uom.lk e-learning and knowledge sharing platform in which I was a founding member.

2017
> **Elite PhD Scholars' Programme**, recipient of the Elite PhD Scholarship which is a joint PhD scholarship scheme awarded by The University of Melbourne and the University Grants Commission of Sri Lanka.

2013
> **Full Scholarship**, to participate in 3rd South Asian Workshop on Research Frontiers in Computing (2013) at the School of Computing, National University of Singapore, Singapore.

> **The Migara Ratnatunga Trust Award, IESL**, awarded for excellent performance in the Undergraduate Internship Program by Institution of Engineers, Sri Lanka.

2009 – 2014
> **Dean's List Distinction**, awarded for achieving a semester GPA of 3.8 or above (Semesters 1,2,3,4,7,8).

2011
> **Sri Lankan Finalist - Microsoft Imagine Cup** , in the "Software Design" category.

2008
> **The Dr. G. C. L. De Silva Memorial Prize, Royal College, Colombo**, awarded for achieving distinctions in all main subjects in G.C.E. A/L and G.C.E. O/L examinations.

Speeches, Presentations, and Volunteer Work

2021 – 2022
> **Proctor**, for IEEEXtreme 15.0 and IEEEXtreme 16.0.

> **Exchange Administrator**, Sri Lanka National Committee, IAESTE.

2021
> **Speaker**, Topic: **Introduction to Data Engineering and Pipelines** conducted for *"Introduction to Data Science for CSE curriculum"*.

> **Moderator**, Aim Higher 2021 - Panel discussion on graduate studies.

2017 – 2018
> **Volunteer**, CIS Postgraduate Group, The University of Melbourne.

2012 – 2013
> **Secretary**, IAESTE (Sri Lanka).

2009 – 2013
> **Web Administrator**, IAESTE (Sri Lanka).

Interests

> Listening to podcasts (The Soundtrack Show, GTCC, Watts Occurring)
> Formula 1
> Beginner in cycling
> Reading (Science Fiction, Biographies)