NIPUNA UPEKSHA

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EDUCATION

University of Moratuwa, Sri Lanka. *2016 - 2021*
B.Sc.Engineering (Hons.) specialized in Electronic and Biomedical Engineering GPA: **3.3/4.2**
Department of Electronics and Telecommunication Engineering

Richmond College, Sri Lanka. *2001 - 2015*
G.C.E. Advanced Level(A/L) - Physical Stream 2015

Mathematics	**A**	Z-Score: **2.357**
Physics	**A**	District Rank: **26**
Chemistry	**A**	National Rank: **247** (out of $\sim$ 35,000 Candidates)
General English	**A**	

G.C.E. Ordinary Level(O/L) 2011

Religion - **A** Mathematics - **A** English - **A** Appreciation of English Literary Texts - **A**
Sinhala Language & Literature - **A** Science & Technology - **A** History - **A**
Information & Communication Technology - **A** Business Studies & Accounting - **A**

IJSE - Institute of Java and Software Engineering, Sri Lanka. *2015*
CMJD - Comprehensive Master Java Developer Certification

WORK EXPERIENCE

WSO2 Inc. *May 2021 - Present*

Software Engineer, Identity & Access Management.

Certifications

- WSO2 Certified Identity Practitioner - V5
- WSO2 Certified Identity Developer - V5

Sanota Pvt. Ltd. *June 2019 - December 2019*

Trainee Electronics & Biomedical Engineer

RESEARCH EXPERIENCE

University of Moratuwa, Sri Lanka. January 2020 - July 2021
Prototyping a Functional Hearing Aid *Advisor: Dr. Anjula De Silva*

· Final year group project(4 members) done with the collaboration of Wickramarachchi Institute of Speech & Hearing.
· Over 5% of the world's population and over 9% of the Sri Lankan population have hearing impairments.
· Since, good quality hearing aids are quite expensive, this project was initiated as the first step to make a good quality local hearing aid.

- Implemented several algorithms including, dual adaptive filter method for feedback cancellation, coherence algorithm for adaptive directionality using two omni-directional microphones, adaptive filter methods for noise cancellations(LMS, NLMS, ANLMS, RLS, AFA) and frequency shaper function for gain controlling.
- Apart from the above mentioned algorithms tested out a pool of algorithms including Fennec dipole adaptive directionality method and wavelet transformations.
- Algorithms were first implemented on MATLAB and tested out using subjective and objective metrics including Mean Opinion Score(MOS), Perpetual Evaluation of Speech Quality(PESQ), SNR and SRT.
- After that the selected algorithms were implemented on TMS320C5535 eZDSP development board using the Code Composer Studio.
- My tasks were to implement the algorithms in C for the DSP, test them out and read the previous research works on developing hearing aids.

Sanota Pvt. Ltd., Sri Lanka. June 2019 - December 2019
AGV Management System *Advisors: Mr. Teran Wanniarachchi, Mr. Sahan Ranasinghe*

- Automatic Guided Vehicles(AGVs) are used in most of the factories to transport items internally.
- This project was an innovative way of locating the AGVs inside the factory using a network of ESP8266 modules.
- The ESP network gets the RSSI values from the ESPs attached to AGVs and those AGVs send real-time position of them.
- To determine the AGV position, binary metal codes were attached to the magnetic stripe pathways and detected them via the inductive sensors attached to the AGVs.
- Then the exact positions of the AGVs are determined using trilateration and showed in a desktop application.
- My tasks were to prototype the system using Arduino first, test it using ESP8266 and NodeMCU modules, determine the position using the inductive sensors and trilateration and making a Java application to show the positions of the AGVs.

Self-initiated Research Project 2020
Twitter K-Means Clustering

- This project was done to identify the common areas that the twitter users are tweeting about.
- The unsupervised learning method of K-means clustering was used to get an idea about those areas.
- Several python libraries were used including *pandas* for data processing, *nltk* for data cleaning, tokenizing and lemmatizing, *sklearn* for feature extraction and processing, and *matplotlib, seaborn* and *wordcloud* for exploratory data analysis.
- Tfidf vecotrization and elbow method were used to find the number of clusters and the K-means clustering was done using them.

OTHER PROJECTS

Univeristy of Moratuwa, Sri Lanka. Semester 5 - 2019
Image Downsample Processor Design *Advisor: Dr. Jayathu Samarawickrama*

- A Verilog and Schematic based processor design which uses a MATLAB bases algorithm for image processing.
- The Intel Quartus Prime Suite was used for implementation while Modelsim Altera was used for simulation process.

University of Moratuwa, Sri Lanka. Semester 5 - 2019
FIR Filter Implementation *Advisor: Dr. Chamira U.S. Edussooriya*

- Using IIR and Kaiser windowing technique, an FIR filter was made,
- This project was done in order to understand the nature of infinite impulse response response filters.

IJSE - Institute of Java and Software Engineering, Sri Lanka 2015
Payroll Management System *Advisor: Dr. Niroth Samarawickrama*

- This was the final project of the CMJD course.
- Used Java Swing, MySQL and Netbeans to develop a payroll system using singleton and MVC patterns.
- This project was selected to the *five* best projects done in the batch.

Coursera Project Network 2021
Unsupervised Machine Learning for Custom Market Segmentation

- This project was done as a part of a Coursera course.
- Marketing segmentation is crucial for maximizing marketing conversation rate.
- Serveral python libraries such as, *pandas, sklearn, matplotlib, seaborn,* and *numpy* were used in this project to get the K-means clustering using elbow method.

Coursera Project Network 2021
Ristorante Con Fusion

- This project was done as a partial fulfillment of two coursera courses.
- Implemented in both *React* and *Angular* to grasp the concepts of the frameworks.
- Typescript was used for the Angular version and Javascript was used for the React version.

Trip Recommender

- This was a freelance project done using Ionic/Angular for the front-end, NodeJs/Express for the back-end and MySQL for the database implementation.
- Here, users can input the details of the location they are willing to go, and find the accommodation and travelling vehicles according to those particulars.

SELECTED AWARDS AND HONORS

Richmond College Colors for Chess *2015*

Mahapola Merit Scholarship for Engineering Undergraduates
Awarded by the Government of Sri Lanka for the students who excelled at the G.C.E A/L Examination *2016*

Richmond College Merit Award
Awarded by Richmond College for the students who excelled at the G.C.E. A/L Examination *2016*

Several district, provincial and all-island chess awards *2005 - 2015*

EXTERNAL COURSES

Machine Learning Specialization **University of Washington, USA.** *Coursera*

- Machine Learning Foundations: A Case Study Approach
- Machine Learning: Regression
- Machine Learning: Classification
- Machine Learning: Clustering and Retrieval

Foundations of Data Science: K-Means Clustering in Python **University of London, UK.** *Coursera*

Python for Genomic Data Science **John Hopkins University, USA.**

Text Mining & Analytics **University of Illinois-Urbana Champaign, USA.** *Coursera*

Frontend Web UI Frameworks & Tools: Bootstrap 4 **Hong Kong University of Science & Technology, Hong Kong.** *Coursera*

Frontend Javascript Frameworks: Angular **Hong Kong University of Science & Technology, Hong Kong.** *Coursera*

Frontend Javascript Frameworks: React **Hong Kong University of Science & Technology, Hong Kong.** *Coursera*

Introduction to Programming with MATLAB **Vanderbilt University, USA.** *Coursera*

SKILLS

Programming Skills:
Java, Python, Javascript, C/C++, Matlab, HTML, SCSS/CSS, PHP, Verilog, LaTeX

Databases:
MySQL, MongoDB, Oracle

Frameworks:
React, Angular, Ionic, Express, NodeJS, CodeIgnitor

Hardware:
Arduino, PIC, FPGA, Raspberry Pi, TMS320C5535 eZDSP, Node MCU, ESP8266

Tools & Software
Quartus Prime, Modelsim Altera, Simulink, Altium, Solidworks, IntelliJ IDEA, Netbeans, Adobe Photoshop, Code Composer Studio, Eclipse

Languages:
English, Sinhala

INTERESTS & SKILLS

Chess, Swimming, Travelling, Astronomy