

THENUKAN PATHMANATHAN

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Personal Statement

Highly enthusiastic, self-motivated, and dedicated individual with a sound knowledge base and hands-on experience. Enthusiastic about working in the domains of **data science, and machine learning**.

Education

University of Moratuwa, Sri Lanka **CGPA – 3.62 (out of 4.2)** 2018 – Present
B.Sc Eng. (Hons.) in Electronic and Telecommunication Engineering

- Data structures and algorithms (A+)
- Machine vision(A+)
- Fundamentals of image processing (A-)
- Linear algebra(A)
- Modular software development (A)
- Differential equations (A+)

G.C.E Advanced Level Examination

2017

- Combined Mathematics, Physics and Chemistry – **3A's**
- **98th place at the national level(Z-score: 2.3040)**

Experience

Drenlo.com (Startup) Jul 2022 - Dec 2022
Machine Learning Engineer (part time) *Weetangera, Australia*

Building a question answering platform for medical domain books.

- I mainly worked on a paragraph suggestion for a related question.
- I used a vector search algorithm with semantic features that were extracted from the paragraph and the question using a pre-trained model.
- I extracted the Contents of the book and saved it in JSON format to render the paragraphs using OCR technology.

Minox Techno (Pvt) Ltd Jan 2022 - Jul 2022
Research and Development Engineer (internship) *Colombo, Srilanka*

Measurement delimitation analysis on the coating to define its boundaries and determine its thickness

- Using a set of IR sensor data collected from coating layers with varying degrees of noise, I applied the DSCAN and HDSCAN unsupervised clustering algorithms to predict the measurement ranges of each coating level and identify decision boundaries by filtering out the noise data. [github Link](#)
- I performed basic mathematical analyses, including K-means and the Elbow method, to count the number of layers in a given coating using the provided data.
- After completing the mathematical analyses, i connected the model to a user interface using C# .NET framework.


Crack identification in the surface of the silicon wafer

- I isolated individual parts on a wafer from a larger image using image processing technique in OpenCV.
- I Extracted the images features using the VGG16 model and Used PCA to dimensional reduction, XGboost algorithm to train and test.
- I have developed a UI application using C# that utilizes a model to predict whether an image contains cracks or not.
- I achieved an accuracy rate of 78 % for a prototype model despite having a small dataset of images.

Projects

Few-shot learning (Final year project) Sep 2022 - Present

- A research project primarily focuses on the area of image classification with limited samples.
- I improved the accuracy of existing distribution-based algorithms by 1% using a Bayesian perspective.
- So far, my main focus has been on generators and the contrastive learning strategy in order to make improvements.
- Now we are generating GAN Based feature generation model for creating extra image feature to make correct distribution.

web development for a job-seeking website.	June 2021
<ul style="list-style-type: none"> The online job seeking system is a platform designed for job seekers to easily find job opportunities. HTML, CSS, and JavaScript 	
Synthetic image detection (<i>Video & Image processing cup 2022, IEEE Signal processing society</i>)	July 2022
<ul style="list-style-type: none"> I participated in the video & image processing cup and worked on a project related to synthetic image detection. Specifically, I trained an auto encoder method to extract partial manipulation information from images, which was then used as input for an ensemble CNN model. 	
Synthetic audio detection (<i>IEEE Signal processing cup 2021</i>)	May 2021
<ul style="list-style-type: none"> A system for synthetic speech attribution. Our solution detects which method among a list of algorithms has been used to synthesize the speech. using a neural network and Mel frequency spectrum we get 93% accuracy.  github Link 	
K-diagnose	Aug 2022
<ul style="list-style-type: none"> We did a device in order to diagnose the chronic kidney disease at an early stage using urine conductivity and machine learning techniques which will facilitate to do community testing and to get the test results immediately. 	

Online Courses

Object-Oriented Programming (coursera)	2022
Web Design for Beginners (Open Learning Platform - UoM)	2022
Front-End Web Development (Open Learning Platform - UoM)	2022
Server-side web programming (Open Learning Platform - UoM)	2022
Machine Learning and Deep Learning Specialization (Stanford)	2020
Big Data in the Age of AI (LinkedIn)	2022
Natural Language Processing in TensorFlow (DeepLearning.AI)	2022
AWS Machine Learning Foundations (udemy)	2022
SQL(365-Data Science)	2022
Data Engineering Foundations (LinkedIn)	2022
Big Data with Apache Spark and AWS (udemy)	2022

Technical Skills

Programming Languages: Python, Java, JavaScript
ML Frameworks & Tools : Tensorflow, Keras, AWS, Pandas
Operating Systems : Windows, Linux
Hardware : Raspberry Pi, Arduino

Experiences from Competitions

8 th place in the world -IEEE Video & Image Processing Cup 2022: Synthetic Image Detection	2022
17 th place -IEEE Signal Processing Cup 2022: Synthetic Speech Attribution	2022
5 th place -SPARK 2022: K-diagnose	2022

Honors and Awards


Dialog Merit Scholarship	2018
Mahapola Higher Education Merit Scholarship	2019
LinkedIn badge for successful completion and involvement in RaspberryPI JAM series.	2022

Clubs and Societies

IEEE-Student membership	2020 – Present
E-Club, UoM-Regular member	2019 – Present
St. John Ambulance, Sri Lanka-Cadet Sergeant	2013 – 2014

References

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