

# Tashin Kavishan

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## Summary

I am striving to apply mathematics, machine learning, and image processing skills to provide effective solutions in the healthcare industry.

**Interest Areas:** My interests are mainly focused on Bio medical Device design, Pattern Recognition, Deep learning, Medical Imaging and Digital Signal Processing. I hope to contribute to innovative solutions that bridge technology and healthcare industry.

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## Education

**Faculty of Engineering, University of Moratuwa** Aug. 2022 - present  
Bachelor of Science (Hons) in Engineering  
Specialising in Biomedical Engineering  
GPA: 3.61/4.0

**H/Debarawewa Central Collage Tissamaharama** Jan. 2012 - 2020  
GCE Advanced Level - Physical science stream - 3A passes Physics -A, Chemistry - A, Combined Mathematics - A with a Z-score of 2.5876  
GCE Ordinary Level - A-8 B-1

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## 1 Working Experience

**Exceltech Consulting (Pvt) Ltd** Research and Electronic Engineering Intern  
  

- Working with Image Processing, embedded and bio medical projects
- Working with FDA approval Documentation
- Skills with Altium, PLC coding, Image processing

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## Projects

**CareAI – Intelligent Multi-Modal Disease Prediction and Early Warning System** Ongoing  
Built an AI-based early disease risk prediction system using EHR and laboratory data, modeling patient-test-disease relationships with Heterogeneous Graph Neural Networks. Implemented meta-path graph construction and transformer-based semantic fusion to deliver accurate, explainable early warnings for Non-Communicable Diseases.

**MRI Image Classification with End-to-End MLOps Pipeline** ongoing  
Designed and implemented a deep learning-based MRI image classification system with a full MLOps lifecycle, including training, evaluation, model versioning, and deployment. Utilized MLflow for experiment tracking and model registry, Docker for environment reproducibility, and AWS cloud infrastructure for scalable, production-grade inference of medical imaging models.  
<https://github.com/kavishanGT/MLFlow-project.git>

**Breast Lesion Segmentation** Image Processing Project  
Breast lesion segmentation in ultrasound videos, introducing a novel Frequency and Localization Feature Aggregation Network (FLA-Net) for improving segmentation performance. The model combines frequency-based feature aggregation with temporal learning and incorporates localization features through a two-branch decoder. A contrastive loss function helps the network differentiate between lesion locations in neighboring frames and frames from different videos. Below is a PyTorch implementation for a simplified version of this approach, based on the concepts discussed.  
<https://github.com/kavishanGT/Breast-Lesian-Segmentation.git>

**ECG Sensor and Monitor Design** Semester 3 Project  
For the analog project in EN2091 Module, my team and I designed an ECG monitor device using analog electronic components only. A microprocessor was used to visualize the ECG signal onto an LCD screen  
<https://github.com/kavishanGT/Heart-Rate-Monitor>

**Walking Abnormality Detector** Semester 3 Bio Medical Project  
For the Bio Medical Device Design in BM2210 Module, my team and I designed a pressure measuring footwear using load cells to detect pressure of foot. We visualized the real time pressure distribution using python.  
<https://github.com/Team-Gyros/Walking-Abnormality-Detector>

**Predict the Potato diseases** self-initiated  
A Convolutional Neural Network trained on a Potato leaves dataset to detect potato diseases.  
<https://github.com/kavishanGT/potato-deseases>

**Classifying Data for detect diabetic** self-initiated  
Train a machine learning model to detect the diabetic persons considering given data of him such as blood glucose level, blood pressure, age etc.  
<https://github.com/kavishanGT/Trained-data-set-to-detect-diabetic.git>

**AI mouse - Opencv** self-initiated  
Hand Gesture Mouse Pointer with AI project in my free time! Using OpenCV, it lets you move mouse pointer, click and scroll up and down with hand gestures. I worked on this project to gain experience with OpenCV.  
<https://github.com/kavishanGT/AI-mouse>

**Tranied dataset to classify lungs image to detect penumonia**  
I have trained a data set of x-rays of lungs to classify penumonia desease. Mainly I used tenserflow framework and keras library to develop the model. <https://github.com/kavishanGT/Trained-dataset-for-Pneumonia.git>

**Pick and Place Robot arm** Semester 4 project  
As the semester 4 Engineering Design Realization module, we design a robot system to pick and place MOSFET transistors,washers and nuts. <https://github.com/kavishanGT/Assembling-Part.git>

**Mark-Attendance-using-face-recognition**  
This project is a Face Recognition Attendance System. It uses computer vision techniques to recognize faces and mark attendance automatically. The system captures an image of a person, identifies the face, and matches it against a known database. If a match is found, the person's name and the current timestamp are recorded in a CSV file named attendance.csv. This file keeps track of who was present and at what time, making it a useful tool for automating attendance tracking in environments like classrooms or offices. <https://github.com/kavishanGT/Mark-Attendance-using-face-recognition.git>

**Dream Guard - The sleep Inducer** Semester 2 Project  
A device that is used to calm our brain with suitable frequency to reach our sleep. With using electro-magnetic field because it is not harmful for human body.  
<https://github.com/kavishanGT/Dream-Guard-Biomedical-Sleep-Inducer.git>

## **E-Stethoscope — Real-Time Electronic Stethoscope System**

ESP32, MATLAB, Signal Processing

Designed and implemented a real-time electronic stethoscope for heart sound (PCG) acquisition using an ESP32-C3 microcontroller and Developed a MATLAB-based signal processing backend for bandpass filtering, envelope extraction, and heart rate estimation. Implemented UDP-based wireless data streaming from embedded hardware to MATLAB for low-latency processing and complete hardware-software biomedical system pipeline suitable for research and prototyping.

<https://github.com/kavishanGT/Electronic-Stethoscope.git>

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## **Honors and Awards**

**Annual Best Prefect in H/Debarawewa President Collage**

**Best Student Award in Southern Province - Mathematics** 2017

**General Knowledge Competition - Sri Lanka Police Day - Gold medal** 2017

**Deep Learning Essentials with Keras by Coursera Authorized by IBM**

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## **Volunteering**

### **IEEE EMBS Student Chapter, University of Moratuwa**

- Brainstorm 2024 - Design Team member Dec. 2023 - present
- Brainstorm 2024 - Event team member Jul. 2023 - present
- Member Jan. 2023 - Jun. 2023

### **Sasnaka Sansada Foundation**

Sasnaka Sansada Foundation is a charitable social service organization registered under the Companies Act No 07 of 2007 of the Socialist Democratic Republic of Sri Lanka (Reg No GA/2762).

It is an organization with a national vision to serve our society by improving Sri Lanka's school education system. Not only that, our organization is always trying to contribute to society by conducting various social service activities. Sasnaka Sansada has now expanded to all 25 districts of Sri Lanka and has been actively serving the society for the past 27 years.

Projects such as Ganitha Saviya, Learn Steer, Lohitha Uthpada, Sisura Sadaya, Regreen Earth, and Meet my Mentor are just a few examples of the initiatives currently undertaken by Sasnaka Sansada nationwide. Furthermore, the organization hosts numerous spiritual events throughout every year to reflect the organization's roots, which are well-inculcated with the essence of Buddhism.

- **District Coordinator - Hambantota District** Jan. 2022 - Dec. 2024
- **National Coordinator of Sasnaka Sansada Sisu Madiya** Jan. 2023 - Present  
Sasnaka Sansada Sisu Madiya is the most important and valuable programme which is helped for the rural area schools, hospitals, children's homes and any other places where helpless children are living. Sasnaka Sansada is always fed from volunteers who are like to do their best for the society. So Sisu Madiya is the best project who are willing to their career for the society. So far we have held many valuable projects under the Sisu Madiya project like library repairing and book donations, stationary distributions for school children, classroom repairing, giving essential equipments for hospitals. Sisu Madiya project is also a good opportunity to develop our skills and leadership.

### **EXMO23 Technological Exhibition**

EXMO 2023 is the flagship technological exhibition of the University of Moratuwa, Sri Lanka.

- Project Demonstration - ECG Monitor

<b>Mathematics Society, University of Moratuwa</b>	Jan. 2023 - present
Member	
<b>Electronic Club, University of Moratuwa</b>	Jan. 2023 - present
Member	

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## Technical Skills

- **Languages:** Python, MATLAB, C, C++, Javascript
  - **Markup:** HTML, CSS,
  - **Frameworks:** Tensorflow, Pytorch, NumPy, Scikit-learn, React JS, Node JS
  - **Software:** Altium Designer, Solidworks, Adobe Photoshop, Flask, Multisim
  - **Tools/Other:** Git, Github
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## References

- **Dr. Chamira U. S. Edussooriya**  
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