Shihab Aaqil Ahamed

Curriculum Vitae

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Research Interests

- Optimization
- Machine Learning
- Computer Vision
- Deep Learning

Education

University of Moratuwa **June 2021 – Present**

Bachelor of Science (Hons) in Electronic and Telecommunication Engineering & Minor in Mathematics *May 2022 – Present*

- Pathway: Computer Vision and Pattern Recognition
- CGPA: 3.51/4.0 (Second Class Upper Division - Honors)
- Current Semester: 5th Semester

Zahira College, Kalmunai, Sri Lanka **January 2017 – August 2019**

General Certified Examination Advanced Level *August 2019*

- Z-Score: 2.5593
- High Distinctions for Physics, Chemistry, Combined Mathematics (Physical Science Stream)
- District Rank: 2, Island Rank: 152 (out of ∼ 35,000 candidates)

MOOCs

- EPFL Optimization: Principles and Algorithms - EdX Linear Optimization† Network and Discrete Optimization* Unconstrained Nonlinear Optimization*
- Machine Learning Specialization - Coursera 1† 2† 3*
- Data Science and Machine Learning Bootcamp† - Udemy
- Deep Learning Specialization - Coursera 1† 2† 3† 4† 5*
- Mathematics for Machine Learning and Data Science Specialization - Coursera 1† 2* 3*
- DeepLearning.AI TensorFlow Developer Professional Certificate - Coursera 1† 2† 3* 4*

Projects

Machine Learning Projects

ML Parameters Optimization: | *Grid Search, Randomized Search & Bayesian Search Optimization Techniques* **June 2023**

- Implemented GridSearch, Randomized Search, and Bayesian Optimization to enhance model performance.
- Evaluated regression models using diverse Key Performance Indicators (KPIs) for accurate assessment.
- Demonstrated expertise in Scikit-Learn, showcasing understanding of hyperparameter optimization strategies.

NLP: Twitter Sentiment Analysis | *Python, NLTK, TextBlob, Naïve Bayes Classifier & Jupyter Notebook* **June 2023**

- Developed a supervised learning model to predict sentiment from thousands of user tweets.
- NLP libraries - NLTK and TextBlob - Tokenization used for text preprocessing and scikit-learn for ML modelling.
- Accuracy of 94% was obtained using naïve bayes classifier model.

Telecom Customer Churn Prediction | *Scikit-Learn, Logistic Regression, SVM, K-NN, Random Forest Classifier* **May 2023**

- Trained classifiers to predict telecom customer churn using Logistic Regression, SVM, K-NNs and Random Forest Classifier algorithms.
- Evaluated models with AUC score and ROC curve analysis, Amongst all the trained models, Random Forest Classifier achieving the highest performance.
- Random Forest Classifier model: Achieved ∼96% accuracy, ∼96% precision for retained customers, and ∼94% precision for churned customers; recall rate of ∼99% for retained customers and ∼76% for churned customers.

University Admission Classification | *Scikit-Learn, NN, Regression Models - Multiple LR & Jupyter Notebook* **July 2023**

- Built regression models for university admission predictions from student profiles, Utilized Linear Regression, ANN, and Decision Trees for accurate predictions.
- Achieved highest performance through Artificial Neural Networks, Random Forest, and Decision Trees.

NLP: Resume Selector | *Python, Scikit-Learn, NLP - NLTK, TextBlob - Tokenization* **August 2023**

- Developed Naïve Bayes model for model to predict flagged resumes rom a dataset of 125 resumes (33 - flagged, 92 - not flagged); using Python, Scikit-Learn, and NLP - NLTK, TextBlob - Tokenization.
- Cleaned and preprocessed resume text by removing punctuation and stop words.

Applied Convolutional Neural Networks | *Python, Jupyter Notebook* **May 2023**

- Built a model to detect cars in an image using YOLO(You Only Look Once) algorithm.
- Implemented Neural Style Transfer using Deep Convolutional Networks to generate artwork given style and content images.

Selected Undergraduate - Electronic Projects

Solar Wifi Router | *Altium Designer, Proteus, Solidworks* **May 2022 - October 2022**

- Developed WiFi and LED UPS with 12V rechargeable battery for reliable power during outages, supporting AC and solar charging.
- Used smart relay technology for transitions between power sources (AC, solar), ensuring uninterrupted WiFi and LED performance, facilitating real-time battery charging.
- Created a user-friendly PCB design and enclosure, enhancing usability through intuitive switches, resulting in a dependable solution for power backup requirements.

Analog Linear Power Supply | *Altium Designer, NI Multisim, Solidworks* **October 2022 - February 2023**

- Designed a 10V linear power supply with 10A max current, incorporating step-down transformer, bridge rectifier, and Sziklai pair regulation, featuring current limit and short circuit protection.
- Implemented efficient thermal management using heat sinks, finalized in a single-layer PCB enclosed with a 3D-printed case and 12V DC fan for optimal heat dissipation.
- Developed a robust power supply system, utilizing Zener diode, smoothing capacitor, and advanced transistor configuration to achieve stable performance under varying load conditions.

Robot Design | *Webots R2021b, C++, Arduino, Solidworks* **March 2023 - June 2023**

- Designed virtual robot for tasks: Line Following, Dotted Line Following, Segmented Wall Following, Chess Board Arena and physical robot for tasks: Line Maze, Curved wall, Blind box, Line following
- Mastered diverse Problem Solving approaches, Time Management and Effective Teamwork.

Simple Solar Battery Charger | *Altium Designer, NI Multisim, Solidworks* **March 2023 - June 2023**

- Designed Simple Solar Battery Charger, utilizing LM338/LM317T solar controllers to ensure reliable and safe charging of rechargeable batteries with solar energy.
- Implemented LED indicators for real-time monitoring of battery charge levels, enhancing user accessibility and maintenance efficiency.
- Created a cost-effective and lightweight, making the Simple Solar Battery Charger ideal for diverse outdoor activities.

Relevant Coursework

Computer Vision and Pattern Recognition: EN3160 Image Processing and Machine Vision*, EN3150 Pattern Recognition*
Mathematics: MA1014 Mathematics(A), MA2024 Methods of Mathematics(A+), MA2014 Differential Equations(A), MA2024 Calculus (A-), MA2034 Linear Algebra*, MA3014 Applied Statistics*, MA3024 Numerical Methods*
Miscellaneous: EN1020 Signals and Systems (A), EN2063 Signals and Systems, CS2024 Data Structures and Algorithms(A)

Technical Skills

Languages: C, C++, Matlab, Overleaf LaTeX, Python
Developer Tools: Google Colab, Jupyter Notebook, PyCharm, VS Code
Version Control: Git, GitHub
Technologies/Frameworks: PyTorch, Tensorflow, Keras
Mathematics: Optimization, Calculus, Linear Algebra, Probability and Statistics, Principal Component Analysis(PCA)

Experience

ScholarX 2023 Mentee **Remote**
Sustainabe Education Foundation *June 2023 - Present*

- Mentored by Ms. Theshani Nuradha, PhD Student at Cornell University, USA.
- Explored Optimization and algorithms, Machine Learning and Privacy and Secure AI (Federated Learning)
- Contributed to creating a sustainable education structure in Sri Lanka.

Honours And Awards

Jinnah Scholarship **October 2020**
The High Commission of Pakistan *Colombo, Sri Lanka*

- I've been granted the Jinnah Scholarship for outstanding performance in Advanced Level Examination. This scholarship is awarded on a merit basis. Under this program, each successful student receives a stipend of SL Rs. 50,000 as assistance for one year to pursue their studies.

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