Last updated on June 19, 2024

Masdar City
*Abu Dhabi, **UAE***
+971 50 164 3552
+94 77 300 89 37
shihabaaqilahamed@gmail.com
shihab.ahamed@mbzuai.ac.ae
ahamedmbsa.20@uom.lk
mb-shihab-aaqil-ahamed.github.io

Shihab Aaqil Ahamed

Curriculum Vitae

Google Scholar | Homepage | Twitter | LinkedIn | GitHub

"A self-motivated and highly-talented undergrad student equipped with the strong fundamental background knowledge and technical skills in mathematics, computer science, and related fields with solid research experience, programming skills, and passionate in solving real-world problems with open source cutting edge research contributions and publish research papers in top-venue conferences; in machine learning and deep learning for computer vision applications, particularly for the task of optimization, self-supervised learning, calibration, few-shot / zero-shot learning and life-long learning."

Research Interests

Optimization | **Video Understanding** | **Self-Supervised Learning** | **Computer Vision** | **Machine Learning**

Experience

IVAL Computer Vision Lab – Mohamed bin Zayed University of Artificial Intelligence — **Abu Dhabi, UAE**
Research Assistant, *Computer Vision | **IVAL** – **MBZUAI** Lab | Advisor: –* — *November 2023 – Present*
*Acceptance rate is **4.8%** | A fully funded scholarship sponsored by MBZUAI, UAE Government* — *Internship*

- Working as a **Research Assistant** in the Department of Computer Vision at the MBZUAI.
- Research on the topic of self-supervised learning from videos for down-stream tasks (e.g, action recognition). In particular, rigorously exploring a self-supervised contrastive learning approach for videos capable of learning **rich spatio-temporal representations and semantic attributes**.

Education

University of Moratuwa, Sri Lanka — **June 2021 – Present**
*Bachelor of Science of Engineering **(Honors)** – **B.S.,** ENTC Electronics and Telecommunication Engineering & Minor in Mathematics* — *May 2022 – Present*
*Studies fully funded by **Ministry of Higher Education, Sri Lanka*** — *Katubedda, Sri Lanka*

- Pathway: Computer Vision and Pattern Recognition
- Current Semester: 5th Semester

Zahira College, Kalmunai, Sri Lanka — **January 2011 – August 2019**
*General Certificate of Education – **G.C.E.,** Advanced Level & Ordinary Level, Physical Sciences* — *Z-Score: 2.5593*
*Studies fully funded by **Ministry of Education, Sri Lanka*** — *Kalmunai, Sri Lanka*

- Studied Grades 6-9 at the Bilingual Education Unit **(BEU)**, an educational unit of Zahira College, Kalmunai provides education in both English and Tamil mediums for students up to Ordinary Level (O/L) Examination.
- 3As (High Distinctions) for Physics, Chemistry & Combined Mathematics (Physical Sciences)
- District Rank: 2, National Rank: 152 (out of ~ 35,000 candidates) in Physical Science Stream (National University Entrance Examination)

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*
- PyTorch for Deep Learning with Python Bootcamp - Udemy
- 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

RetailVision: Densely Packed Product Detection from CVPR 2020 Challenge | *SSD* *SKU-110K_fixed* *Tensorflow* — **November 2023**

- Developed and implemented a SSD: Single Shot MultiBox Detector based on the object detection paper: "SSD - Single Shot MultiBox Detector" using TensorFlow.
- Enhanced retail vision by replacing the existing VGG backbone with DenseNet, to achieve better performance.
- Calibrated the default anchors to better suit and trained the model on the SKU-110K dataset, collects 11,762 densely packed shelf images, each containing an average of 200 objects, often similar or identical and positioned in close proximity from supermarkets around the world.

Meta Learning for Omniglot Character Few Shot Classification using MANN | *FSL* *Omniglot Character* *Tensorflow* **October 2023**

- 5 way 1-shot classification was implemented using Meta Learning Approach.
- MANN: Memory Augmented Neural Network was implemented from the scratch using tensorflow and keras and it is used to classify the Omniglot Handwritten Character Recognition, a dataset with 1623 characters from 50 different languages. Each character has 20, 28x28 images
- Accuracy of 99.48% was achieved around 1000 epochs by using 128 units LSTM layer as the controller network.
- Published a detailed Medium article: Medium Article

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 modeling.
- 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 and Competition | *Webots R2021b* *C++* *Arduino* *Solidworks* **October 2022 - February 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 (A+)

Mathematics: MA1014 Mathematics (A), MA2024 Methods of Mathematics (A+), MA2014 Differential Equations (A), MA2024 Calculus (A-), MA2034 Linear Algebra (A), MA3014 Applied Statistics (A), MA3024 Numerical Methods (A-)

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, GitHub Copilot
Technologies/Frameworks: PyTorch, Tensorflow, Keras
Mathematics: Optimization, Calculus, Linear Algebra, Probability and Statistics, Principal Component Analysis(PCA)

Honors 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.

Best Results Award: G.C.E Adavanced Level Examination 2019, Physical Sciences **December 2019**
Zahira College Kalmunai, Srilanka *Kalmunai, Sri Lanka*
- I received the honor of being awarded for achieving the best results in the G.C.E. A/L examination 2019 in the physical sciences, where I obtained 3 A grades in Physics, Chemistry and Combined Mathematics.

*Ranked **152nd** in **National University Entrance Examination** out of approximately ~ 35,000 candidates* ***December 2019***

*A travel grant of up to **AED2,280.00** to purchase flight to Abu Dhabi, **MBZUAI** sponsored **visa,** and on campus accommodation.* ***May 2024***

References

References available upon request.

Last updated on June 19, 2024

–
Shihab Aaqil Ahamed
Research Assistant, Computer Vision | **MBZUAI**
Undergraduate | **B.S., Engineering**
Department of **Electronics and Telecommunication Engineering**
University of Moratuwa
Sri Lanka.
Mobile: +971 50 164 3552 / +94 77 300 89 37
Academic