Mohamed Afham

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Education

University of Moratuwa, Sri Lanka Aug 2017 - Present (Expected Graduation: May 2022)
CGPA: 3.78 (First Class Honours)
B.Sc (Hons) - Electronics and Telecommunication Engineering Dean's List: Semester 1,2,4

St. Joseph's College, Trincomalee, Sri Lanka Grad: Dec 2016
GCE Advanced Level (Mathematics, Physics, Chemistry, General English) 4As / 11th in country / z-score of 2.78
(country-wide university entrance examination taken by over 100,000 students annually)

MOOCs
Deep Learning: 5-course specialization (on Coursera) (Certificate earned - May 2020)
Mathematics for Machine Learning Specialization (on Coursera) (Certificate earned - Dec 2019)

Experience

VeracityAI, Colombo, Sri Lanka
Associate Machine Learning Engineer - Part time (Jun 2021 - Present)

- Research and development of state-of-the-art algorithms for vehicle damage detection system
- Experimenting with real-world dataset of vehicle damages with the developed algorithms
- Development of algorithms for PDR pattern recognition in car to facilitate better damage detection.

MBZUAI, Abu Dhabi, UAE
Research Assistant - Internship (Oct 2020 - Apr 2021)
Advisor: Dr. Salman Khan

- Worked as a research assistant for the computer vision department in the university research division.
- Experimentation on available Vision + Language models to facilitate few-shit image classification.
- Research on Few Shot Learning with focus on leveraging natural language descriptions to improve few-shot image classification.

Publications / Preprints

Mohamed Afham, Salman Khan, Muhammad Haris Khan, Muzammal Naseer and Fahad Shahbaz Khan, **Rich Semantics Improve Few-Shot Learning** *(BMVC 2021)*

Mohamed Afham, Udith Haputhanthri, Jathurshan Pradeepkumar, Mithunjha Anandakumar, Ashwin De Silva and Chamira Edussooriya, **Towards Accurate Cross-Domain In-Bed Human Pose Estimation** *(submitted for review, 2021)*

Mohamed Afham, Isuru Dissanayake, Dinithi Dissanayake, Amaya Dharmasiri, Kanchana Thilakarathna and Ranga Rodrigo, **CrossPoint: Self-Supervised Cross-Modal Contrastive Learning for 3D Point Cloud Understanding** *(submitted for review, 2021)*

Amaya Dharmasiri, Dinithi Dissanayake, Isuru Dissanayake, **Mohamed Afham**, Ranga Rodrigo and Kanchana Thilakarathna, **Part Semantic Aware Latent Space Navigation for Controlled Regeneration of 3D Point Clouds** *(submitted for review, 2021)*

Research Projects

3D Point Cloud Understanding (May 2021 - Present)

- Investigation on leveraging self-supervised, contrastive learning for better point cloud understanding
- Survey on existing unsupervised methods for efficient pretraining of 3D point clouds
- Experimentation on various techniques to utilize pretraining strategies from 2D domain to 3D point cloud domain

In bed Human Pose Estimation (June 2021 - Oct 2021)

- Research and experimentation with state-of-the-art methods for domain adaptation in in-bed pose estimation
- Analysis on various domain adaptation techniques for pose estimation
- Outcome: `https://arxiv.org/abs/2110.03578`

Few-Shot Learning (Oct 2020 - June 2021)

- Research and experimentation on state-of-the-art few-shot image classification methods
- Analysis on integrating natural language descriptions to improve few-shot image-classification
- Outcome: `https://arxiv.org/abs/2104.12709`

Other Projects

Twitter Sentiment Analysis Github Link, Blog Article

- Developed a supervised learning model classifiy the user tweets as positve and negative.
- Used NLP libraries such as NLTK and TextBlob for text preprocessing and scikit-learn for ML modelling.
- Accuracy of 93% was obtained using naive bayes classifier model.

Few-Shot Image Classification using Memory Augmented Neural Networks Github Link, Blog Article

- 10 way 1-shot classification was implemented using Meta Learning Approach.
- Memory Augmented Neural Network cell was implemented from the scratch using tensorflow and keras.
- Accuracy of 99% was obtained by using 128 units LSTM layer as the controller network.

Deep Neural Network for ECoG Handpose Detection

- Implemented a single layer LSTM to decode pre-processed ECoG signals.
- Performed Multi-Class classification and obtained 84% accuracy in the given dataset.

Customer Churn Prediction

- Implemented a Machine Learning model with LightGBM algorithm to predict the churning behaviour of the customer based on the business in past 36 months

Selected Awards / Hackathons

2nd Runner Up - Video and Image Processing Cup, IEEE ICIP, Alaska, USA (Virtual) 2021
IEEE SMC Winners - BR41N.io hackathon, IEEE SMC Conference, Toronto 2020
Runner Up - DataStorm v1.0, Organized by Rotaract Club of University of Moratuwa 2020
Ranked 191st in the world - IEEExtreme 13.0 2019
Champions - Intellihack v1.0, Organized by University of Colombo School of Computing 2019
Bronze Medalist - International Mathematics Competition for University Students, Bulgaria 2018
Honorable Mention - International Mathematics Olympiad (IMO), Thailand 2015
Merit Award - International Mathematics Competition 2014
Gold Medalist - Sri Lanka Physics Olympiad 2016

Relevant Courseworks

Computer Vision: EN2550 Fundamentals of Image Processing and Machine Vision **(A)**, EN4553 Machine Vision (Ongoing)
Mathematics: MA2023 Calculus **(A+)**, MA 2033 Linear Algebra **(A+)**, MA4043 Neural Network and Fuzzy Logic (Ongoing)
Miscellaneous: EN1060 Signals and Systems **(A)**, EN2570 Digital Signal Processing **(A)**, CS2022 Data Structures and Algorithms **(A-)**, EN2040 Random Signals and Processes **(A-)**

Skills

Languages: Python (proficient), MATLAB
Experience & Interests: Computer Vision, Machine Learning
Utilities: PyCharm, VSCode, Git
Cloud Computing: AWS, Microsoft Azure
Frameworks: PyTorch, Tensorflow, Keras

Volunteering and Professional Services

Invited Reviewer

- CVPR 2021 (h5-index: 356)
- IET Computer Vision (h5-index: 26)

Global Volunteer - AIESEC in Hungary 2019
President - Majlis-Ul-Islam, University of Moratuwa 2021 - Present
Project Chair - YES YOU CAN, Majlis-Ul-Islam, University of Moratuwa 2018

- Series of Mathematics Seminars based on GCE(O/L) curriculum in Sri Lanka

Participant - Sakura Science Exchange Program in Science, Japan 2017