Aamir
Mustafa

🎂 12 June 1995

🌐 Academic Website

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in LinkedIn Profile

○ Github Profile

G Google Scholar Profile

Education ─────────

PhD in Machine Learning for
Computer Graphics
University of Cambridge, UK
October 2019 - Present

Bachelors of Technology in
Electronics Engineering
National Institute of Technology, India
Aug 2014 - Aug 2018

Skills ─────────

Languages
Python, C, Matlab, Octave, R

Libraries
PyTorch, Tensorflow, Keras

Machine/Deep Learning
Multi-Instance Learning, DNN, CNN,
SVM, Random Forest, K-means,
Decision Trees, Recurrent Networks:-
LSTM & GRU, k-nearest neighbor,
Naive Bayes

Extra-Curricular ─

Co-ordinator @ Data Science Lab
- Organized seminars & workshops
- Prepared a proposal for
development of a Data Science Lab
under Innovation Incubation
Entrepreneurship Development (IIED)
Centre at NIT Srinagar.

Honours ─────────

- GOLD MEDALIST in Secondary
School Examination (10th). Ranked
1st in the state out of 50585 students.
- Ranked 9th in the state out of 51391
students in 12th JK BOARD exams.

Work Experience and Internships

Oct'19-Present University of Cambridge — Research Assistant
- Working on semi-supervised techniques for image to image translation.

Sep'18-Sep'19 Inception Institute of Artificial Intelligence, Abu Dhabi — Research Intern
- Designed a novel training scheme for image classification task making the model robust against adversarial attacks, by restricting the hidden space of deep networks.| Paper| Code
- Designed a non-differentiable defense mechanisms by selectively adding high frequency components to an image which nullify the effect of adversarial perturbations. | Paper| Code

Dec'17-Mar'18 Indian Institute of Technology, Ropar — Research Intern
- Worked on prediction and localization of student engagement in response to a stimuli video (e-learning environment) from facial expressions using Deep Multi-Instance Learning (SVM and Neural Network). Paper

Dec'16-Feb'17 University of Canberra, Australia — Research Intern
- Estimation of Heart rate of different individuals and its variations over the span of video from their facial videos by extracting plethysmograph (PG) signals from green channel of the frames.
- Considering heart rate as extracted feature, individuals are classified into two categories - healthy controls and depressed patients using a linear SVM classifier.| Paper

Research Publications

A. Mustafa, S.H. Khan, M. Hayat, R. Goecke, J. Shen, L. Shao "Adversarial Defense by Restricting the Hidden Space of Deep Neural Networks" International Conference on Computer Vision (ICCV) 2019. Paper, Code.

A. Mustafa, S.H. Khan, M. Hayat, R. Goecke, J. Shen, L. Shao "Deeply Supervised Discriminative Learning for Adversarial Defense" IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI) 2019 (under submission).

A. Mustafa, S.H. Khan, M. Hayat, J. Shen, L. Shao "Image Super-Resolution as a Defense against Adversarial Attacks" IEEE Transactions on Image Processing (TIP), 2020. Paper, Code

A. Mustafa, S. Bhatia, M. Hayat, R. Goecke, "Heart Rate Estimation From Facial Videos for Depression Analysis", Seventh International Conference on Affective Computing and Intelligent Interaction (ACII), 2017 Paper

A. Kaur, A. Mustafa, L. Mehta, A. Dhall, "Deep Multi-Instance Learning: Prediction and Localization of Student Engagement in the Wild", Digital Image Computing: Techniques and Applications (DICTA) 2018. Paper, Code.

Research and Projects

Sep'18-Sep'19 Evaluating the Robustness of Deep Neural Networks
Trained a neural network to reduce the polytope overlap amongst various classes to guarantee model's robustness against adversarial attacks.

Aug'17-Jun'18 Surveillance- Fight/Violence Detection on Streets from CCTV Footages
Feature extraction using Optical flow vectors and 2D-CNN's.

Jun'17-Aug'17 Human Action Recognition
Designed a computationally less intensive architecture with minimal space and time complexity to perform human action recognition. 2D CNN is used to extract frame-wise features and then 1D CNN is used to extract temporal dependencies among frames.
Comparing the architecture with *i)* LSTM temporal dependency model and *ii)* Fine tuned pre-trained ImageNet Model for time complexity.