

# AAMIR MUSTAFA

 [LinkedIn](#)  [Github](#)  [Google Scholar](#)  [Academic Webpage](#)

University of Cambridge, UK

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## INTERESTS

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Machine Learning, Deep Learning, Computer Graphics, Computer Vision

## EDUCATION

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**PhD in Machine Learning for Computer Graphics** October 2019 - Present  
Department of Computer Science & Technology, University of Cambridge, UK

**Bachelor of Technology Electronics & Communication Engineering** August 2014 - July 2018  
National Institute of Technology, Srinagar, India  
CGPA : 8.741/10

[Courses Studied](#)

## RESEARCH PUBLICATIONS

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**A. Mustafa**, R. K. Mantiuk “Transformation Consistency Regularization: A Semi-Supervised Paradigm for Image-to-Image Translation” European Conference on Computer Vision (ECCV) 2020. [Paper](#), [Code](#), [Project Page](#).

**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) 2020. [Paper](#), [Code](#).

**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.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. Bhatia, M. Hayat, R. Goecke, “Heart Rate Estimation From Facial Videos for Depression Analysis”, 2017 Seventh International Conference on Affective Computing and Intelligent Interaction (ACII) [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](#).

## EXPERIENCE

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**Rainbow Group, University of Cambridge** Oct 2019 - Present  
*Research Assistant* *under Dr. Rafal K. Maniuk*

- Designing a novel training schemes for reducing the amount of training data required for various Image-to-Image Translation tasks.
- Working on Perceptual loss functions for better image generation.

**Inception Institute of Artificial Intelligence, Abu Dhabi** Sep 2018 - Sep 2019  
*Computer Vision Research Intern* *Adversarial Attacks and Defenses*

- Designed a novel training scheme for image classification task making the model robust against adversarial attacks, by restricting the hidden space of deep networks.
- Designed a non-differentiable defense mechanisms by selectively adding high frequency components to an image which nullify the effect of adversarial perturbations.

**Indian Institute of Technology, Ropar***Computer Vision Research Intern*

Dec 2017 - Mar 2018

*under Dr. Abhinav Dhall*

- 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).

**University of Canberra, Australia***Machine Learning Research Intern*

Dec 2016 - Feb 2017

*under Prof. Roland Goecke & Dr. Munawar Hayat*

- 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.

**Texas Instruments***Embedded Engineering Intern*

Dec 2015 - Jan 2016

*NSIT, Delhi*

- Designed an Electronic Dice, 7 LEDs (5 mm) programmed using MSP 430 micro-controller (TI micro-controller).
- Embedded system circuit design on Eagle and integration on the micro-controller using Code Composer Studio (CCS).

**SKILLS**

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**Machine Learning**

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

**Languages and Libraries**

Python, Matlab, R, Octave, PyTorch, Tensorflow, Keras, Java, C

**COURSES TAKEN**

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- Introduction to Graphics.
- Advanced Graphics
- Machine Learning & Bayesian Inference.

**SUPERVISIONS**

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- Supervised Part II (Undergrad Student) at University of Cambridge for his project titled "Extracting MIDI Data From Video of a Piano Using Computer Vision".
- Supervised 3 M.Phil Students at University of Cambridge for their Advanced Graphics Project on "Image Style Transfer in the Gradient Domain using CNNs."

**ACHIEVEMENTS**

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Received funding for PhD from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme. 2019

Ranked 9<sup>th</sup> in the state out of 51391 students in 12<sup>th</sup> JK BOARD exams. 2013

GOLD MEDALIST in Secondary School Examination (10<sup>th</sup>).  
Ranked 1<sup>st</sup> in the state out of 50585 students. 2011

Silver Certificate Awardee-DUKE OF EDINBURG INTERNATIONAL VOLUNTEERING AWARD  
International Award for Young People (IAYP) . 2011