

**Md. Mushfiquir Rahman**  
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Website: <https://mushfiquir11.github.io/>      GitHub: <https://github.com/mushfiquir11/>  
Career Interests: **Computer Vision**, **Machine Learning** and **AI Research**

**EDUCATION AND ACADEMIC HIGHLIGHTS**

<b>Islamic University of Technology (IUT)</b>	2017 – Mar 2021
<i>BSc in Computer Science and Engineering</i>	CGPA 3.77/4.00 (after 6 semesters)
Medium of instruction: English	
Expected date of graduation: <b>Mar 2021</b>	
<ul style="list-style-type: none"><li>• Thesis: Image Restoration with Generative Adversarial Networks</li><li>• Obtained OIC scholarship</li><li>• Worked at IUT Computer Vision Lab (supervisor: Prof. Dr. Md. Hasanul Kabir)</li></ul>	
<b>Notre Dame College</b>	2014 – 2016
Medium of instruction: English	
<i>Higher-Secondary School Certificate, Science</i>	GPA 5.00/5.00
<b>St. Joseph Higher Secondary School</b>	2006–2014
Medium of instruction: English	
<i>Secondary School Certificate, Science</i>	GPA 5.00/5.00
<i>Junior School Certificate</i>	GPA 5.00/5.00

**TEST SCORES**

<b>GRE</b> (Date: 4th Nov 2020 )	327/340
QR: 167    VR: 160    AWA: 4.0	
<b>TOEFL</b> (Date: 17th Oct 2020 )	105/120
Reading: 29/30    Listening: 30/30    Speaking: 23/30    Writing: 23/30	

**RESEARCH PUBLICATIONS (Peer-reviewed)**

- Md. Mushfiquir Rahman**, S. B. Noor, F. H. Siddiqui,  
**Automated Large-scale Class Scheduling in MiniZinc**, Accepted at *2020 2nd International Conference on Sustainable Technologies for Industry 4.0 (STI)* [Pre-print]  
*Funded by the University Grant Commission (UGC), Bangladesh*  
*(Indexed by IEEE Xplore Digital Library)*
- Class-scheduling as a constraint satisfaction problem modeled using MiniZinc and solved using Chuffed solver
  - I developed the core model and conducted relevant experiments
- Md. Mushfiquir Rahman**, N. M. Zahin, K. R. Mahmud, A. B. Ansar,  
**Automated Intersection Management with MiniZinc**, Accepted at *2020 2nd International Conference on Sustainable Technologies for Industry 4.0 (STI)* [Pre-print]  
*(Indexed by IEEE Xplore Digital Library)*
- A heuristic based solution to the grid-lock problem at traffic intersections built using MiniZinc. The model minimizes overall time delay by regulating traffic signals
  - I formulated the problem, designed the base-solution and wrote the primary implementation using MiniZinc

## ON-GOING RESEARCH PROJECTS

**Md. Mushfiqur Rahman**, T. Abedin, K. S. S. Prottoy, A. Moshruha, F. H. Siddiqui.

**Video captioning with stacked attention and semantic hard pull**, *Under review at a peer reviewed journal (PeerJ CS)*. [Pre-print]

- A lightweight solution to video captioning problem that can effectively capture higher level features of a video
- Introduced two novel concepts – “Stacked Attention” and “Spatial Hard-Pull” and a novel scoring metric “SS score” for video captioning models
- I designed the main model including the novel techniques

### **Image Restoration with Generative Adversarial Networks**

*Academic Thesis, Supervised by Prof. Dr. Md. Hasanul Kabir*

- Generative Adversarial Networks in restoration and reconstruction of old broken images by inpainting, deblurring and denoising
- Introduced a novel loss function – “structure loss”, to retain edge consistency of the original image

M. M. Morshed, **Md. Mushfiqur Rahman**, H. T. Iqbal

### **Artificial Abstraction and Reasoning Generation**

*On-going research*

## WORK EXPERIENCE

**Dhaka University of Engineering and Technology**, Gazipur

*Research Assistant*

Feb 2020 – Jul 2020

- Worked with Dr. Fazlul Hasan Siddiqui (head of CSE department, DUET)
- Built an automated university scheduler using heuristic approach and authored a research paper

**Samsung R&D Institute Bangladesh**, Dhaka

*Intern*

Nov 2019 – Jan 2020

- Worked on a research project that aimed at generating realistic equirectangular images from 3D models using GAN
- Implemented the conditional GAN architecture adjusted for spherical images

**M-World**, Bangladesh

*Game Development Team Lead*

Jul 2019 – Sept 2019

- Developed 2 android games using Unity and C# for a nutrition awareness project (funded by GAIN and BSMMU)
- The two games – Pothe pothe and Radhuni Ami are available in play-store.

**Harriken**, Dhaka

*Intern*

Nov 2017 – Dec 2017

- Harriken was a tech start-up where I worked as an intern for 2 months
- My primary duty was to coordinate with the clients and convey their needs to the developers

**Bangladesh Mathematical Olympiad**

*Academy Team Member (Voluntary)*

Dec 2016 - Mar 2017

- Our main responsibility was to prepare questions for the olympiads and to analyze interesting and innovative solutions

## RELEVANT ACTIVITIES

### Notable Projects

- Parameter reduction of image classifier: Finding lowest parameter model while maintaining minimum 80% top-1 accuracy. The research project was conducted using **Pytorch in Python**
- Implementation of a Real-time Object Detection for Autonomous Vehicles using YOLOv5 using **Pytorch in Python** with extensive use of **opencv**
- A Bengali Hand-written Digit Recognition with **Tensorflow in Python**
- A simple Bengali OCR application for **Android** (available at [play-store](#)). The machine learning model was developed with **Tensorflow and Keras**
- A travel manager desktop application with network-socketing written in **Java**
- A cricket scoring desktop application written in **C++ (Qt platform)**

### Additional Courses and Certifications

- Completed the Deep Learning Specialization (by DeepLearning.ai) on Coursera including all the 5 courses in it
- Completed the Machine Learning Course (by Stanford University) on Coursera
- Completed the Introduction to Psychology (by University of Toronto) on Coursera

## ACHIEVEMENTS

- Silver medal in a Kaggle competition – "Bengali.AI Handwritten Grapheme Classification"
- Runner-up of *Inter University App Development Contest*, 2019 ICT Fest
- Champion of *ICT4D at 4th AUW ICT Fest 2018*
- Top 10 finish in "Dhaka-AI Traffic Detection Challenge 2020"
- Completed round 3 in **Google foo-bar challenge** (still on-going)
- 2 times National Topper and Gold Medalist in **International Assessment for Schools (Maths) organized by University of New South Wales**
- Reached final round in **Stockholm Junior Water Prize, Bangladesh** in 2015.
- 5 Divisional Medals and 4 National Medals in **Bangladesh Mathematical Olympiad** (2009, 2012, 2013, 2014, 2016). 2 times National Math Camper
- 2 Divisional Medals in **Bangladesh Physics Olympiad** (Dhaka) (2013, 2014)

## REFERENCES

**Dr. Fazlul Hasan Siddiqui**, Professor and Head of the department, Department of Computer Science & Engineering, Dhaka University of Engineering and Technology, Gazipur  
Email: siddiqui@duet.ac.bd

**Dr. Md. Hasanul Kabir**, Professor, Head of Computer Vision Lab, Department of Computer Science and Engineering, Islamic University of Technology, Gazipur  
Email: hasanul@iut-dhaka.edu

**Hasan Mahmud**, Assistant Professor of Computer Science and Engineering Department, Islamic University of Technology, Gazipur  
Email: hasan@iut-dhaka.edu

**Arup Sarkar**, Chief Engineer, Samsung R&D Institute Bangladesh, Dhaka  
Email: arup.sarker@samsung.com