FARIA HUQ

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RESEARCH INTEREST

- Interdisciplinary research of Computer Vision and Computer Graphics
- AR/VR and Interactive System

EDUCATION

- **Bachelor of Science in Computer Science and Engineering**
  Bangladesh University of Engineering and Technology, Dhaka, Bangladesh
  Expected Date of Graduation: February 2021 (Academic Session Delay due to COVID-19 pandemic)
  Current CGPA: 3.49/4 (Completed 7 out of 8 terms)
  Major CGPA: 3.56/4 ; Final Two year CGPA: 3.59/4
  Thesis Topic: Review4Repair: Code Review Aided Automatic Program Repairing
  Thesis Supervisor: Dr. Anindya Iqbal, Associate Professor, Department of CSE, BUET

PUBLICATIONS & PREPRINTS

1. Review4Repair: Code Review Aided Automatic Program Repairing
   Faria Huq, Masum Hasan, Mahim Anzum Haque Pantho, Sazan Mahbub, Dr. Anindya Iqbal, Toufique Ahmed. Submitted to Information and Software Technology, (https://arxiv.org/abs/2010.01544)
2. Static and Animated 3D Scene Generation from Free-form Text Descriptions
   Faria Huq, Dr. Nafees Ahmed, Dr. Anindya Iqbal. Submitted to MDPI Journal of Imaging, (https://arxiv.org/abs/2010.01549)

RESEARCH EXPERIENCE

Review4Repair: Code Review Aided Automatic Program Repairing [Preprint] **April '19 - May '20**
Supervisor: Dr. Anindya Iqbal (BUET) *Submitted (Under Review)*
Keywords: Automatic Program Repair, Natural Language Processing

- We, for the first time, aim to generate code changes (i.e, to fix programming bugs) by understanding the code review comment written in natural language.
- By integrating code reviewer's instruction into automatic code repair, we boost the state-of-the-art performance by 20.33% in Top-1 prediction and 34.82% in Top-10 predictions compared to prior studies.

Static and Animated 3D Scene Generation from Free-form Text Descriptions [Preprint] [code] **February '20 - May '20**
Supervisors: Dr. Nafees Ahmed (Waymo), Dr. Anindya Iqbal (BUET) *Submitted (Under Review)*
Keywords: Visual Art, Natural Language Processing, Computer Graphics

- We aim to generate static as well as animated 3D scenes from different types of free-form textual scene description.
- We design a two-stage pipeline which encodes the free-form text using an encoder-decoder neural architecture and generates a 3D scene based on the generated encoding. Our neural architecture exploits state-of-the-art language model as encoder to leverage rich contextual encoding and a new multi-head decoder to predict multiple features of an object in the scene simultaneously with 98.427% accuracy.

Citadel: An Automated Abuse Detection System to Detect and Prevent Abusive Behaviors over Emails **October '18 - August '20**
Supervisor: Dr. A. B. M. Alim Al Islam (BUET) *Preparing manuscript for submission*
Keywords: Interactive System, Natural Language Processing

- We aim to generate a system which analyzes incoming emails and predicts abusive ones. Our graphical interface allows users to take preventive measures and ask for help from corresponding authority.
- In this research project, I contributed to develop a deep-learning based language model using Keras. Our model can handle grammatical and spelling mistakes both at character and word level. [code]
- I also contributed to develop the frontend in Google Chrome Engine Platform. [code]

Novel View Synthesis from blurred images [Project Page] **June '20 - Present**
Supervisors: Dr. Nafees Ahmed (Waymo), Dr. Anindya Iqbal (BUET) *Expected date of Completion: March, '21*
Keywords: Neural Rendering, View Synthesis, Image Deblurring

- We aim to synthesize a target image with an arbitrary target camera pose (novel view synthesis) from given a source image of a dynamic scene containing motion blur and its camera pose.
- Our key insight is to utilize neural rendering to jointly remove motion blur artifact using deblurring technique and synthesize novel views from high-dimensional spatial feature vectors. We are using Stereo Blur Dataset for our experimental analysis.

Real-world Anomaly Detection in Surveillance Videos by Analyzing Human Pose and Motion **May '20 - Present**
Supervisor: Dr. Mohammad Saifur Rahman (BUET) *Expected date of Completion: April, '21*
Keywords: Explainable AI, Human Pose and Body Keypoints Analysis, Video Understanding

- We propose to investigate the relation of human pose with anomalous activities by utilizing human body keypoints.
- We are building an attention based hierarchical Multi Instance Learning (MIL) model to analyze and interpret anomalous human activities with respect to particular human motions and poses.

NOTABLE PROJECTS

Interactive 3D Interior Design Simulator **[Github]**
Supervisor: Dr. Mohammad Saifur Rahman (BUET)
A 3D interactive interior design tool to explore internal space and how it might be better utilized. The users can navigate around a room and modify furnitures, wall and floor features.

AR_ASL: OCR based reading tool for hearing-impaired people **[Demo]**
Achievement: Presented in the International Women Hackathon, 2020
AR_ASL converts text to American Sign Language in real-time to help hearing-impaired children in reading their textbook.

Tori: A Mental Health Care Tracker and Chatbot using Machine Learning **[Github]**
Achievement: First place in the national hackathon, Hack_A_Day, 2018.
A lifestyle monitoring and mental health care application that tracks users' online activity, analyzes signs of depression and communicates with them.

Moodsong: A ChatBot that Responds According to the Emotional State using Image processing **[Github]**
Achievement: First place in the BUET CSE Fest Hackathon, Cloud Computing Category, 2019.
A chatbot which can communicate with users based on their emotional state. It analyzes the users' facial emotion and suggests user specific genre of songs, memes and jokes depending on the mood of the user.

PocketAid: Medical Assistance App **[Github]**
Achievement: Featured as one of the best projects in LearnITGirl, Third edition, a global mentorship program for international female students. [Featured Page]
PocketAid is a medical assistance mobile app that can analyze user-symptoms for disease prediction. It also provides medical services such as medication reminder, emergency contact, first aid guide in offline settings.

Hati: Health Awareness Video Game **[Github]**
Achievement: Selected to be presented as one of top 25 projects in SS12 Maker Fair, 2017.
An android game for children to inspire them to eat healthy food and understand the affects of junk food.

WORK EXPERIENCE

Game Developer Intern **August 2019 - September 2019**
Supervisors: Saikat Islam (Facebook) and Shamim Ashik (Uber)
Mentee **October 2017 - January 2018**
Organization: Learn IT, Girl!

AWARDS

January'19 BUET CSE Fest Hackathon: Champion in 'Cloud Computing' Category
December'18 Banglalink SDG Hackathon: 1st Runners Up and was offered internship for building a solution to curb Plastic Pollution
May'18 BUET CSE Fest Inter-University Hackathon: Champion in 'Mental Health' Category
March'18 MobilPro 2018: I was selected for the 5th international competition organized by the Faculty of Electronics, Telecommunications and Information Technology, Bucharest, Romania
March'18 Internationally Featured Project in "Learn It, Girl", Third Edition (Top 12 out of 106). I was the only participant selected from Bangladesh as well.
April'18 Anita's Moonshot Codeathon 2018: Special Mention for an Augmented Reality Application to help women raise awareness against different kinds of vaginal infection (Top 8)
December'17 Banglalink Ennovators 2017: Finalist and was offered internship for building an application to support women empowerment and employment (Top 20)
December'17 Hackathon for Environmental Migrants: I was selected to participate in this specialised hackathon organized by Dr. Ingrid Boas, Assistant Professor at the Environmental Policy Group, Wageningen University with collaboration of BBC Media Action

TECHNICAL SKILLS

- **Programming Language:** Python, Java, C, C++, C#, Shell, HTML, CSS, Javascript, Matlab, Intel 8086 Assembly Language
- **Framework:** Pytorch, Pytorch3D, Tensorflow, OpenCV, OpenGL, Django, Arduino, Three.js, AR.js, Nuget
- **Tool:** Blender, Unity, Vuforia, Android Studio, Firebase, Google Chrome App Engine

SERVICES

1. **Batch Representative at BWCSE (Bangladeshi Women in Computer Science and Engineering)** **June'16 to present**
2. **Student Ambassador at 'Grameenphone GameJam 2017'** **March'17**
3. **Student Representative at 'Google Developers Group, Dhaka'** **September'19 to present**

REFERENCE

Available upon Request