FARIA HUQ

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RESEARCH INTEREST

- Interdisciplinary research of Computer Vision and Computer Graphics
- Vision and Language
- 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

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 developed a novel architecture that can generate code change guided by the code review comment written in natural language.
- We are the first to integrate code reviewer's instruction into automatic code repair and boost the state-of-the-art performance by 20.33% in Top-1 prediction and 34.82% in Top-10 predictions.
- We developed a large dataset of 55,060 training data and 2,961 test data of code changes and their associated code reviews.

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) *Submitted (Under Review)*
Keywords: Interactive System, Natural Language Processing

- We have proposed a framework that can predict and prevent abusive email by text analysis using Natural Language Processing. Our 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. For user authentication, I used Gmail API. [code]

Holistic Static and Animated 3D Scene Generation from Diverse Text Descriptions [Preprint] [code] **February '20 - May '20**
Supervisors: Dr. Nafees Ahmed (Waymo), Dr. Anindya Iqbal (BUET) *Preparing manuscript for submission*
Keywords: Natural Language Processing, Computer Graphics

- We deployed state-of-the-art TransformerXL architecture to capture contextual encoding of scene description to transfer into a 3D scene.
- We built an attention-based novel decoder that can predict object specific multiple features parallelly with 98.427% accuracy.
- Our method can generate both static and animated 3D shapes using non-differentiable renderer.

Novel View Synthesis from blurred images [Project Page] **June '20 - Present**
Supervisors: Dr. Nafees Ahmed (Waymo), Dr. Anindya Iqbal (BUET) *Expected date of Completion: January, 2021*
Keywords: Neural Rendering, View Synthesis, Image Deblurring

- We are trying to improve state-of-the-art novel view synthesis architecture for dynamic scenes containing motion blur.
- 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: January, '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. We are using Real-world Anomaly Detection in Surveillance Videos Dataset for our experimental analysis.

NOTABLE PROJECTS

Interactive 3D Interior Design Simulator **[Github]**
Supervisor: Dr. Mohammad Saifur Rahman (BUET)
A JavaFX based 3D interior design tool which allows users to navigate around a room and change & add furnitures.

AR_ASL: OCR based reading tool for hearing-impaired people **[Demo]**
Achievement: Presented in the International Women Hackathon, 2020
AR_ASL is an application which converts Text to American Sign Language in real-time. AR_ASL is designed for helping hearing-impaired children in education.

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.

A ChatBot that Responds According to the Emotional State of the User
Achievement: First place in the BUET CSE Fest Hackathon, Cloud Computing Category, 2019.
We developed a chatbot which uses various cloud APIs to process texts and images and interacts with the user accordingly. It uses Google's FACE API to analyze the users' facial emotion and suggests user specific genre of songs 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 and suggest proper actions. It also provides medical services such as medication reminder, emergency contact, first aid guide without using internet.

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.

Feluda: Adventure Video Game **[Github]**
Achievement: Selected to be presented as one of top 40 projects in Backpack Hackathon, 2017.
A puzzle game based on the legendary detective of Bengali Literature - 'Feluda'. I used Unity to build this game.

WORK EXPERIENCE

Game Developer Intern **August 2019 - September 2019**
Supervisors: Saikat Islam (Facebook) and Shamim Ashik (Uber)
Under this one-month long internship, I developed four levels of an adventure game using Unity.

Mentee **October 2017 - January 2018**
Organization: Learn IT, Girl!
Under this three-month long mentorship programme, I developed a health assistance mobile application.

AWARDS

January'19	BUET CSE Fest Hackathon: Champion in 'Cloud Computing' Category
May'18	BUET CSE Fest Inter-University Hackathon Hackathon: Champion in 'Mental Health' Category
December'18	Banglalink SDG Hackathon: 1st Runners Up and was offered internship for building a solution to stop Plastic Pollution
March'18	MobilPro 2018: I was selected for the 5th international competition organized by Faculty of Electronics, Telecomunications and Information Technology, Bucharest, Romania
March'18	Internationally Featured Project in "Learn It, Girl", Third Edition (Top 12 out of 126). 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
- **Tool:** Blender, Unity, Vuforia, Android Studio, Firebase, Google Chrome App Engine
- **Operating System:** Windows, Linux, Android
- **Others:** Git, Latex, Inkscape

SERVICES

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

ACADEMIC HONORS

- Board Merit Scholarship: Government of Bangladesh (years: 2007, 2010, 2013, 2015)
- Academic excellence Scholarship: The Students Welfare Association (years: 2007, 2010, 2011)

REFERENCE

- **Dr. Anindya Iqbal**
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- **Dr. Nafees Ahmed**
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  Computer Science, Stony Brook University,
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