Farhana Khan

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Research Interest

I am a Ph.D. student at **Kahlert School of Computing, University of Utah**. I work under the expert supervision of **Dr Sameer Patil**. My primary field of interest is **Human-Computer Interaction** and **Cybersecurity**.

Education

Kahlert School of Computing, University of Utah *Utah, USA*

Ph.D. in Computer Science *Fall 2024 - Current*

- **Advisor:** Dr Sameer Patil
- **Courses:**
  - Human Aspects of Security and Privacy (F 24)
  - Human Computer Interaction (F 24)

Bangladesh University of Engineering and Technology *Dhaka, Bangladesh*

B.Sc. in Computer Science and Engineering *March 2018 - May 2023*

Industry Experience

Enosis Solutions *Dhaka, Bangladesh*

Software Engineer *Jun 2023 - Jun 2024*

- Collaborated in a team to develop an immersive learning platform for realtime web-based VR/AR training and 3D collaboration via web conferences.
- **Tech Stack:** JavaScript, C++, Node.js, Three.js, Vue.js, WebGl, MongoDB, Assimp, GLM
- **IDE and Others:** Git, Bitbucket, WebStorm, JIRA
- **Experience Certificate:** 🔗

Research Experience

A Comprehensive Analysis of Phishing Email Reports in Organizational Setting *Aug 2024 - Current*

Field: Human-Computer Interactiona and Cybersecurity

- **Supervisor: Dr Sameer Patil**, Associate Professor, KSoC and Faculty Co-Director, DATASET Initiative at the University of Utah

Bridging Educational Gaps: ChatGPT-Enhanced EFL Learning for Underprivileged Students *Aug 2023 - Current*

Field: Human-Computer Interaction

- **Supervisor:** Dr. A. B. M. Alim Al Islam, Professor, CSE, BUET
- **Collaborative Work:** With Penn State University Under the Supervision Of Dongwon Lee, Ph.D. Penn State University, USA
- **My Contribution:** Developed an application for tracking participants performance improvement and data collection.
- **Dev Tools and Frameworks:** React-native, Django, Firebase, Twillo, ChatGPT API

Short Videos, Big Impacts: Unveiling the Secret to Captivating Short Videos *Aug 2023 - Dec 2023*

Field: Human-Computer Interaction

- **Supervisor:** Dr. Sadia Sharmin, Associate Professor, CSE, BUET
- **My Contribution:** Proposed a novel approach for content recommendation in order to reduce the detrimental effects of scrolling through short videos or reels on human cognition.

Risking Privacy for Personalized Recommendations: A Study of Awareness And Security Concern of Recommendation System Users *Aug 2023 - Feb 2024*

Field: Human-Computer Interaction, Recommendation Systems

- **Supervisor:** Dr. Sadia Sharmin, Associate Professor, CSE, BUET
- **My Contribution:** Formulated the core idea, designed questionnaire and interviewed participants.

Privacy Perspectives of Shared Mobile Phones Within Households   *Feb 2023 - Feb 2024*

Field: Human-Computer Interaction
- **Supervisor:** Dr. A. B. M. Alim Al Islam, Professor, CSE, BUET
- **My Contribution:** Interviewed participants

On The Impact and Detection Of Knowledge Graph Based Semantic Aware Shilling Attacks On Recommendation Systems   *June 2022 - Jul 2024*

Field: Recommendation System, Machine Learning, Security   *Thesis Defense Slide*
- **Supervisor:** Dr. Mahmuda Naznin, Professor, CSE, BUET
- **My Contribution:** Implemented 3 different types of recommendation systems, 6 types of Shilling Attacks (including 1 obfuscation) and 3 benchmark shilling attack detection methods and evaluated their performance on the renowned MovieLens and YahooMovies datasets.
- **Dev Tools and Frameworks:** Python, NumPy, Pandas

Achievements

- **Champion** in Ada Lovelace National Girls Programming Contest, Bangladesh - 2021

  Dec 2021

  Team Name: BUET_A_Team_Has_No_Name
- **Champion** in National Girls Programming Contest, Bangladesh - 2021

  Nov 2021

  Team Name: BUET_A_Team_Has_No_Name
- **Champion** in National Girls Programming Contest, Bangladesh - 2019

  Nov 2019

  Team Name: BUET_A_Team_Has_No_Name
- **11th** in National High School Programming Contest, Bangladesh - 2015

  National Level

Projects

Ray Tracing 🔗

OpenGL, C++
- This project is an implementation of realistic image generation of 3D geometric shapes using ray tracing with appropriate illumination techniques.

ManageCasa 🔗

React.js, REST, Django and PostgreSQL
- ManageCasa is a comprehensive web-based property management system designed to simplify and streamline the day-to-day operations of property managers and landlords.

CNN From Scratch 🔗

Python, NumPy
- This is a simple implementation of a convolutional neural network (CNN) from scratch using only numpy. The network is trained on the NumtaDB dataset to recognize Bengali numerical digits.

A Simple Compiler 🔗

C++, YACC, Lex, Shell
- A simple compiler for the language described in the book "Compilers: Principles, Techniques, and Tools" by Aho, Sethi, and Ullman. It is not a complete compiler, but it does implement symbol table, a lexer, a parser, and a code generator.

Online Marketplace 🔗

Django, Oracle DBMS, Bootstrap
- Replica of a popular online marketplace, developed with the intention to learn database management as the term project of the course CSE216: Database Sessional, Level-2 Term-2, CSE, BUET

Picture Puzzle 🔗

Django, MySQL
- Picture Puzzle is a web-based puzzle game developed for the Computer Science and Engineering Festival (CSE Fest) in 2022. It is designed to be responsive and can be played on desktop and mobile devices.

Image Captioning in Bengali ⛓

Python, TensorFlow, Keras, OpenCV
- The project aims to generate captions in Bengali using the benchmark image captioning machine learning model "Show, Attend and Tell", trained on the eminent COCO dataset translated to Bengali.

Skills

Research Method	Interview, Survey, Mixed-method, Experiment, Data Scraping
Analysis	Correlation, Regression, SmartPLS
Programming Languages	C/C++, Python, Java, JavaScript, SQL, Bash, HTML, CSS, Intel 8086 Assembly Language
Tools	Source Tree, Jira, Git, VS Code, JetBrains Products, Wireshark, Latex, Atmel Studio, Logisim, Emu8086
	Cisco Packet Tracer, ns-3
Database	MongoDB, Oracle, SQLite
Frameworks	Express.js, Django, Reactjs, Vue.js, Three.js, Mongoose, React Native, React.js,
API	REST, OpenGL, WebGL
OS	Linux, Windows