# Fahmid Al Rifat

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## PROFESSIONAL EXPERIENCE

**United International University** | *Lecturer* July 11, 2023 - Present

- As a lecturer of computer science at United International University, I conduct courses such as Data Structure and Algorithm, Engineering Ethics, Programming for Data-Science, Object Oriented Programming, Structured Programming Language, Digital Logic Design and also contribute to the academic development by guiding projects and researches. Additionally, I am actively involved in various clubs and arranging events.

**Security and Software Engineering (S2E) lab** | *Graduate Research Assistant* February, 2022 - July, 2023

- Worked on language models, their application, software security and also prompt engineering , code generation, code comment classification etc in three peer-reviewed research papers.

## EDUCATION

**Bangladesh University of Engineering and Technology** March, 2017 - May, 2023
Bachelor of Science in Computer Science and Engineering CGPA (Majors): 3.75/4.00
Department of Computer Science and Engineering CGPA (Last year): 3.91/4.00
Awarded Dean's List Scholarship, 2022–23 session CGPA (Actual) : 3.65/4.00

**Dhaka Residential Model College** February, 2015 - February, 2017
Higher Secondary Certificate (HSC)
Graduated with High Honours in Science GPA: 5.00/5.00

**Rangpur Zilla School** February, 2013 - February, 2015
Secondary School Certificate (SSC)
Graduated with High Honours in Science GPA: 5.00/5.00

## PEER REVIEWED PUBLICATIONS

**28th International Conference on Evaluation and Assessment in Software Engineering (EASE 2024)** | **Link**
**Using Large Language Models to Generate JUnit Tests: An Empirical Study**
*Automated unit test generation, GitHub Copilot*

- Conducted empirical study on code generation models for automated unit test generation under **Professor Joanna C. S. Santos** at the University of Notre Dame, USA.
- Collaborated in the S2E lab, exploring generative models' capabilities for unit test generation. Enhanced skills in data preprocessing, generative models, and global research methodologies .
- Explored effectiveness of Codex, GPT-3.5-Turbo, and StarCoder.

## RESEARCH PROJECTS SUBMITTED

**25th International Conference on Digital Image Computing: Techniques and Applications (DICTA 2024)**| **Link**

**Enhancing the RGB Image Selection Process Using Genetic Algorithms for Steganography**
*Cybersecurity , Image steganography Genetic algorithm , Optimal method*

- Pursued the research project under the guidance of **Dr. M. Sohel Rahman**, Professor of Computer Science and Engineering at Bangladesh University of Engineering and Technology (BUET).

- This research aims to develop an optimal pipeline for selecting RGB cover photos for image steganography using a genetic algorithm and enhance the security of image steganography by creating a secure and efficient method for hiding information within images.

## On-Going Research Works

**Comprehensive Analysis and Detection of Interpersonal Rapport in Virtual Reality Environments**
*Virtual Reality, Unity, Machine Learning, Psychology* **2024 - Present**

**Static Analysis in Containerized Environments by Examining Various Security Tools and Methods.**
*Static Analysis, Containerized Environments, Vulnerabilities* **2024 - Present**

**Fairness Enhancement for MIMIC-IV Pipeline: A Novel Accessible Electronic Health Record Dataset**
*HCI, Fairness and Bias, Machine Learning, Health-Care* **2024 - Present**

## PROFESSIONAL PROJECTS

**Icece Buet Website** | *Laravel, CSS, PHP* May , 2022 | Website

- Led development and maintenance of a full-stack web application for the International Conference on Electrical and Computer Engineering.
- Acted as primary developer, implementing new modules, integrating a payment gateway, and overseeing ongoing maintenance and updates.

**Raven-claws E-commerce Website Development** | *Wordpress, CSS, PHP* November, 2020 | Website

- Developed a full-stack e-commerce web app for Raven-Claws Company, a well-known multi-purpose online shop.
- Enhanced functionality with subscription-based reviews, sales and admin recommendations.

## ACADEMIC PROJECTS

**Dormitory management system** | *Node.js ,React , MongoDB* May, 2022 | GitHub

A Node.js-based web application for efficient dormitory management, encompassing dining, room allocation, automation and various features benefiting students, provost, service personnel, and dining managers.

**Hall management system** | *Django , MongoDB* January, 2022 | GitHub

A web application for managing functionalities of a dormitory which helps student,provost,staffs to complete and keep track of dormitory related process easily under Dr. Md. Mostofa Akbar, CSE, BUET.

**Defending Black Hole Attack** | *Network Simulator 3(NS3) , C , Python , GNU-Plot* January, 2022 | GitHub

Improved AODV protocol in Network Simulator 3 to mitigate the impact of black hole attacks, supervised by Dr. Md. Shohrab Hossain.

**Smart Cart** | *C, Arduino, ATMega 32, Atmel Studio, Proteus 832* November, 2021 | YouTube

Our team developed a functional smart cart prototype with automatic collision detection and handling capability. Implemented through software simulation and small-scale hardware .

**Travel Agency BD** | *Django, Oracle SQL, HTML, CSS* November, 2021 | YouTube

Developed a web application for Travel Agency BD, providing tourism services with accommodation, travel packages and database development, under the guidance of Dr. Muhammad Abdullah Adnan, CSE, BUET.

**Mili Militia Pro** | *Java , JavaFx , Socket programming* November, 2020 | GitHub

Developed a server-client multiplayer adventure game under the supervision of Md. Tarikul Islam Papon, enabling users to create and join battle rooms with a variety of weapons.

**NFS Kill Trone** | *C++, iGraphics Custom Library* November, 2018 | YouTube

Under the supervision of Md. Shohrab Hossain, developed a graphical adventure game was developed utilizing a custom game engine which has been highly praised.

**OTHERS PROJECTS**

- **Digit Recognition with CNN** | *Python , C++* January , 2023 | GitHub
- **Code Commets Classifications NLP** | *Bert, Fast Text, Weka* January, 2023 | GitHub
- **Expectation Maximization Model** | *Python , C++* January, 2023 | GitHub
- **Hamiltonian Cycle detection and Tree Decomposition** | *Python , C++* January, 2023 | GitHub
- **Rastering, Ray Tracing and Antialiasing Pipeline** | *OpenGL ,Python , C++* May, 2022 | GitHub
- **Cryptography Hybrid Model** | *Python , Socket programming* May, 2022 | GitHub
- **Morris Worm** | *Python , C++* May , 2022 — | GitHub
- **Memory Managing, Scheduling feature in Xv6** | *MIT Xv6 code-base* January, 2022 | GitHub
- **Mancala, Casper-Finder-HMM and Puzzle AI** | *C++ , Java* January, 2022 | GitHub
- **Information-System-Design** | *Draw.io , Power-Point* January, 2022 | GitHub
- **Full Working Compiler** | *Flex , Bison , EMU 8086* September, 2021 | GitHub
- **4 bit MIPS pipeline** | *Proteus 832, Logisim* September, 2021 | GitHub
- **File Transfer TCP** | *Java , Socket programming* January, 2021 | GitHub
- **Data Structure And Algorithm** | *C,C++* January, 2021 | GitHub
- **Numerical Methods solving tool** | *python, numpy, pandas* April, 2019 | GitHub
- **Word-Count-JavaFX** | *Java, JavaFX* January, 2019 | GitHub
- **Text-Sliding-iGraphics** | *C++ , iGraphics Custom Library* November, 2018 | GitHub
- **Analog-Clock-iGraphics** | *C++ , iGraphics Custom Library* November, 2018 | GitHub

## HIGHLIGHTED ACADEMIC COURSES

- **CSE-409** Computer Graphics
- **CSE-405** Computer Security
- **CSE-423** Fault-Tolerant Systems
- **CSE-471** Machine Learning
- **CSE-215** High-performance Performance Database Systems

## ACHIEVEMENTS

**Achievements in Capture the Flag (CTF) Competitions**

- Placed Top 10 in the National Cyber Drill 2023
- Placed Final Round in the Leetcon CTF
- Placed Final Round in the SUST CTF

**Mathematical Olympiad** -Position: $3^{rd}$ - Regional

**Victory and Independence Day Art And Literature Competition Award** - Position: Top 1

## SCHOLARSHIPS

**Dean's List Scholarship, BUET, 2022-23**
Students obtaining an average GPA of 3.75 or above in two consecutive terms.

**Technical Scholarship From Government, BUET, 2017-22**
Complimentary scholarship for regular engineering students in BUET.

**Government Scholarship, BANGLADESH, 2015-17**
Awarded For Outstanding Performance in Secondary School Certificate Examination.

## Extra-curricular Activities

**Cyber-Security Club - Vice President**

- Planning and organizing workshops and Capture the Flag (CTF) competitions .
- Led a team of members to participate in Cyber-security events, providing mentorship and guidance
- Collaborated with professors and industry professionals to provide resources and opportunities.

**Attended green brick project organize by UNDP Bangladesh**

**ESPL Mobile Legend tournament runners-up (2020-21)**

## TECHNICAL SKILLS

**Languages:** Java, C, C++, Python, Matlab, JavaFX, Gnu-Plot, Bash, Assembly, Swing

**Database:** Oracle, MySQL, SQLite, MongoDB

**OS:** Windows, Linux (Kali, Ubuntu, Seed-Lab)

**Version Control:** Git (GitHub)

**Frameworks:** JavaFX, Django, Node.js, React

**Web Technology:** HTML, CSS, PHP, Bootstrap, WordPress, JSON, XML

**Graphics Technology:** AutoCAD, Photoshop, Illustrator, PowerPoint, Premier Pro, Kine-Master

**Compiler IDE:** Flex, Bison, EMO 8086

**Micro-Controller:** Arduino, ATMega 32, Atmel Studio, Proteus 832

**Technical Writing:** LaTeX, Beamer, Overleaf

**Other:** Networking Simulator 3 (NS3), iGraphics, Cisco-Packet-Tracer, PyTorch, OpenGL

## CERTIFICATES

**Project Show Judge, Faculty Induction Training UIU** - Fall 2023 and Spring 2023 Sessions

**Problem Solving** - Codeforces, Hackerrank, Choco-solver (CSP), Informatics Olympiad

**Animation, Digital Marketing, Advanced Photography & Graphics Design** - 10 Min School, G-Learn

## REFERENCES

**Dr. M. Sohel Rahman**
Professor, Department of Computer Science and Engineering
Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.
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**Relation**: Undergrad Thesis Supervisor

**Dr. Joanna Cecilia da Silva Santos**
Assistant Professor, Department of Computer Science and Engineering
University of Notre Dame, IN, the United States of America.
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