MOHAMMAD SHAMIM AHSAN

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ABOUT ME

Want to explore and learn new things. Passionate about working on Computer Networks & Security. Always enjoy working with hard-working & enthusiastic people and have a strong commitment to research.

EDUCATION

Bangladesh University of Engineering & Technology April, 2018 - May, 2023
Bachelor of Computer Science and Engineering
Department of Computer Science and Engineering **CGPA**: 3.64/4.00

St. Joseph Higher Secondary School, Dhaka July, 2015 – July, 2017
Higher Secondary Certificate (HSC)
Division of Science **GPA**: 5.00/5.00 (90.3%)

Bangladesh Navy School and College, Chittagong January, 2013 - April, 2015
Secondary School Certificate (SSC)
Division of Science **GPA**: 5.00/5.00

RESEARCH EXPERIENCE

Bangladesh University of Engineering & Technology May, 2022 - Present
Title: Detecting User Activity from Encrypted IoT Traffic
Undergraduate Research Assistant
Supervisor: Dr. Md. Shohrab Hossain **(BUET)** **Collaborator:** Dr. Anupam Das **(NC State University, USA**)

- Implemented a methodology called "*packet-based signature generation & detection system*" for automatically extracting packet-level **signatures** from their network traffic and detecting events of smart home devices.
- Used **Java** at a large scale as the project **codebase** was in Java**.**
- Needed to write **Python**, **Shell-script** and **C++** programmes.
- Monitored network traffic using **Wireshark**.
- Used 4 datasets: **PINGPONG**, **UNSW**, **YourThings**, **Mon(IoT)r**.
- Outperformed the average recall and precision of the existing system.
- Worked as ***first author***; contributed *significantly* in writings.

Bangladesh University of Engineering & Technology January, 2023 - Present
Title: Randomization in Double Coverage Algorithm on a Line for Online *k*-Server problem
Undergraduate Research Assistant
Supervisor: Dr. Md. Saidur Rahman **(BUET)** **Collaborator:** Dr. Abu Reyan Ahmed **(Colgate University, USA)**

- Studied **exact** algorithms, **approximate** algorithms, **randomized** algorithms, **online** algorithms, **heuristics** and **metaheuristics**, and **low memory** algorithms.
- Worked on the implementation of randomization techniques to find ***k*-competitiveness** on the well-known **Double Coverage Line** algorithm.
- Used the **Potential Function Method** and **Interleaving Move Style** for competitive analysis of the algorithms.
- Studied some algorithms in different metric spaces.
- Worked as ***first author***; the core idea, analysis & proof was mine.

ACADEMIC PROJECTS

Image Caption Generator using CNN and LSTM February, 2023
Python, **Flickr dataset** Github
Implemented an image caption generation architecture with **a team of 2 people** where I rolled as a **leader**. In this project,

- Recognized the context of an image and annotated it with relevant captions using **deep learning** methods.

- **CNN** was used to generate a vectorized representation of an image. Then, **LSTM** used the information from CNN to help generate a caption of the image.
- Implemented **Greedy** and **Beam search** strategies and evaluated our architecture using **BLEU** and **METEOR** metrics.

Spacey: Online Space Rental Platform August, 2022
MongoDB, **Express.js**, **Rest.js**, **Node.js**, **CSS** Github, Github, Demo
Created an online platform with **a team of 3 people** where property owners can rent their places or free spaces which helps travelers or business companies to find a home/storage to use. Also designed **BPMN**, **Mock UI** (using **Figma**), **Class**, **ER**, **Sequence**, and **Collaboration diagrams**. Main **modules** of the system were Search, Renting, Hosting, Bookings, Payment, Review-Rate-Complain, Chat, Profile. We used **Stripe** gateway for our mobile banking payment method.

TCP CERL: congestion control enhancement over wireless networks February, 2022
Network Simulator 3(NS3), **C**, **Python** Github
In this project,
- Studied the **TCP-CERL** technique for enhancement of congestion control which is the sender-side modification of **TCP-Reno**.
- Implemented this technique in NS3. The implementation that the authors of the paper did was in NS2.
- Tested on two wireless networks: **Wi-Fi** and **LR-WPAN**. Then, calculated various **performance metrics** such as throughput, end-to-end delay time, delivery-ratio and loss-ratio.

Super Mario (Microcontroller project) July, 2021
C, **Atmel Studio**, **Proteus 8** Github
This is a Proteus **simulation-based** Microcontroller project. Developed a simple game similar to the super mario using **ATmega32**, **LED green Dot Matrix** and **LCD display**. To multiplex two LED matrices, we used the same port for the upper side of both LED's and two different ports for the lower sides of them.

MediSheba October, 2020
Django, **HTML**, **CSS**, **Oracle SQL** Github, YouTube
Developed an online medical system with **a team of 3 people** where doctor, patient and blood-bank are the main **modules**. Django is used here as a framework in Back-end and HTML, CSS are used here as Front-end. The (oracle-based) database of the project was **designed extensively following the relevant ER diagrams**.

MAJOR ASSIGNMENTS

- ***SEED-LABS Attacks*** July, 2022
  Implemented some SEED-LABS attacks such as **Buffer overflow**, **CSRF**, **XSS**, **SQL injection** and **Morris worm**.
  Github, Demo(CSRF), Demo(XSS), Demo(SQL Injection)

- ***Bangla Handwritten Character Recognition using CNN*** February, 2023
  Designed own CNN model from scratch using python and tested on the **NumtaDB** dataset. Github

PRESENTATIONS

- **Conference** presentation in IEEE Computer Society Bangladesh Chapter Summer Symposium 2023 **(IEEE CS BDC SS)**, **Topic:** Randomization in Double Coverage Algorithm on a Line for Online k-Server problem.

SKILLS

Languages	C, C++, Java, Python, Shell script, JavaScript, SQL
Frameworks	Django, React.js, Express, Node.js
Databases	Oracle, MongoDB
Web Technologies	HTML, CSS, Bootstrap
Operating Systems	Windows, Ubuntu, WSL
Technical Writing	LaTeX, Beamer, Overleaf
Others	Git (GitHub), NS3, XV6, Docker, OpenGL, MS Word, MS Excel, MS PowerPoint

ACHIEVEMENTS

Dean's List Award, Bangladesh University of Engineering & Technology 2022- 2023
For outstanding academic performance in **4th** year (with average GPA: 3.97/4.00)

Government Scholarship, Bangladesh 2017- 2022
For outstanding performance in Higher Secondary Certificate Examination
Region position: 83

Government Scholarship, Bangladesh 2015- 2017
For outstanding performance in Secondary School Certificate Examination
Region position: 135

College Final Examination 2016
Merit position: 1 (in whole college)

HIGHLIGHTED ACADEMIC COURSES

Undergraduate courses, Bangladesh University of Engineering and Technology

- CSE-321 Computer Networks
- CSE-405 Computer Security
- CSE-471 Machine Learning
- CSE-461 Algorithm Engineering
- CSE-423 Fault Tolerant Systems
- CSE-453 High Performance Database Systems

LANGUAGES

English	**Bangla**	**Hindi**
Professional Working Proficiency	Native	Listening & Speaking