

# 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

<b>Bangladesh University of Engineering &amp; Technology</b>	April, 2018 - May, 2023
Bachelor of Computer Science and Engineering	
Department of Computer Science and Engineering	<b>CGPA: 3.64/4.00</b>
<b>St. Joseph Higher Secondary School, Dhaka</b>	July, 2015 – July, 2017
Higher Secondary Certificate (HSC)	
Division of Science	<b>GPA: 5.00/5.00 (90.3%)</b>
<b>Bangladesh Navy School and College, Chittagong</b>	January, 2013 - April, 2015
Secondary School Certificate (SSC)	
Division of Science	<b>GPA: 5.00/5.00</b>

## RESEARCH EXPERIENCE

<b>Bangladesh University of Engineering &amp; Technology</b>	May, 2022 - March 2023
<b>Title:</b> Detecting User Activity from Encrypted IoT Traffic	
<i>Undergraduate Research Assistant</i>	
<b>Supervisor:</b> Dr. Md. Shohrab Hossain (BUET)	<b>Collaborator:</b> Dr. Anupam Das (NC State University, USA)
<ul style="list-style-type: none"><li>Implemented a methodology called “<i>packet-based signature generation &amp; detection system</i>” for automatically extracting packet-level <b>signatures</b> from their network traffic and detecting events of smart home devices.</li><li>Used <b>Java</b> at a large scale as the project <b>codebase</b> was in Java.</li><li>Needed to write <b>Python</b>, <b>Shell-script</b> and <b>C++</b> programmes.</li><li>Monitored network traffic using <b>Wireshark</b>.</li><li>Used 4 datasets: <b>PINGPONG</b>, <b>UNSW</b>, <b>YourThings</b>, <b>Mon(IoT)r</b>.</li><li>Outperformed the average recall and precision of the existing system.</li><li>Worked as <b>first author</b>; contributed <i>significantly</i> in writings.</li></ul>	
<b>Bangladesh University of Engineering &amp; Technology</b>	January, 2023 - April 2023
<b>Title:</b> Randomization in Double Coverage Algorithm on a Line for Online $k$ -Server problem	
<i>Undergraduate Research Assistant</i>	
<b>Supervisor:</b> Dr. Md. Saidur Rahman (BUET)	<b>Collaborator:</b> Dr. Abu Reyan Ahmed (Colgate University, USA)
<ul style="list-style-type: none"><li>Studied <b>exact</b> algorithms, <b>approximate</b> algorithms, <b>randomized</b> algorithms, <b>online</b> algorithms, <b>heuristics</b> and <b>metaheuristics</b>, and <b>low memory</b> algorithms.</li><li>Worked on the implementation of randomization techniques to find <b><math>k</math>-competitiveness</b> on the well-known <b>Double Coverage Line</b> algorithm.</li><li>Used the <b>Potential Function Method</b> and <b>Interleaving Move Style</b> for competitive analysis of the algorithms.</li><li>Studied some algorithms in different metric spaces.</li><li>Worked as <b>first author</b>; the core idea, analysis &amp; proof was mine.</li></ul>	

\*\*\*This paper is **submitted** in the International Symposium on Mathematical Foundations of Computer Science (**MFCS**) 2023

## ACADEMIC PROJECTS

<b>Image Caption Generator using CNN and LSTM</b>	February, 2023
<b>Python, Flickr dataset</b>	<a href="#">Github</a>
Implemented an image caption generation architecture with a <b>team of 2 people</b> where I rolled as a <b>leader</b> . In this project,	

- Recognized the context of an image and annotated it with relevant captions using **deep learning** and **computer vision**.
- **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](#)

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, Interaction**, and **State diagrams**. Since this kind of platform has not been established significantly in the under-developing countries, like Bangladesh, we aimed for making this easier and popular to people.

### **TCP CERL: congestion control enhancement over wireless networks**

February, 2022

**Network Simulator 3(NS3), C, Python**

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**

This is a Proteus **simulation-based** Microcontroller project. Developed a game similar to the super mario using **ATmega32, LED green Dot Matrix** and **LCD display**.

### **MediSheba**

October, 2020

**Django, HTML, CSS, Oracle SQL**

[Github](#)

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

## **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**

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

ACHIEVEMENTS

<b>Dean's List Award, Bangladesh University of Engineering &amp; Technology</b> For outstanding academic performance in 4 <sup>th</sup> year (with average GPA: 3.97/4.00)	2022- 2023
<b>Government Scholarship, Bangladesh</b> For outstanding performance in Higher Secondary Certificate Examination <b>Region position:</b> 83	2017- 2022
<b>Government Scholarship, Bangladesh</b> For outstanding performance in Secondary School Certificate Examination <b>Region position:</b> 135	2015- 2017
<b>College Final Examination</b> For outstanding performance in Higher Secondary Certificate Examination <b>Merit position:</b> 1 (in whole college)	2016

HIGHLIGHTED ACADEMIC COURSES

<b>Undergraduate courses, Bangladesh University of Engineering and Technology</b>	
• 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

<b>English</b> Professional Working Proficiency	<b>Bangla</b> Native	<b>Hindi</b> Listening & Speaking
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