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Nazia Afreen

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Research Interest

Machine Learning, Deep Learning, Software Engineering, Networking & Computer Security

Education and Certifications

- **B.Sc. Computer Science & Engineering** **Feb 2017–Present**

  Bangladesh University of Engineering & Technology
  CGPA: 3.89/4.00 (Upto 7 terms)
  (Expected Graduation: May 2022)

- **Higher Secondary Certificate** **2016**

  Viqarunnisa Noon College
  GPA: 5.00/5.00

- **Secondary School Certificate** **2014**

  Viqarunnisa Noon College
  GPA: 5.00/5.00

Research Experience

- **Cross City Deep Transfer Learning Model for Crime Prediction** **2021-Present**

  Supervisor: Dr. Tanzima Hashem

  In this project, we aim to predict crimes of a city where crime data is unavailable using transfer learning. We propose the concept of region matching as our basis for transfer learning. To learn the forecasting beforehand, we developed two deep learning-based units in our project- a region-representation learning unit and a crime prediction unit.

Grants, Honors & Awards

- Dean's List Scholarship. **2017, 2018**
- University Merit Scholarship. **2017**
- Board Talentpool Scholarship in Higher Secondary Certificate Examination. **2016**
- Board Talentpool Scholarship in Secondary School Certificate Examination. **2014**
- Primary School Board Talentpool Scholarship. **2009**

Technical Skills

- Programming Languages: C, C++, C#, Java, Javascript, Python
- Framework/Libraries: React.js, Node.js
- Markup: HTML, Latex
- Scripting: Bash
- Database: PostgreSQL, MongoDB, MySQL, Oracle
- Machine Learning: Anaconda, Keras, Pandas

Projects

- **Who's the Pokemon** | *Deep Learning Project* **2022**
  - A deep learning project using meta-learning paradigm
  - One-shot learning using CNN in Keras

- **CNN from Scratch** | *Deep Learning Project* **2022**
  - Implemented convolutional neural network from scratch for image classification
  - Developed CNN using Python, Numpy, Scikit Learn

- **ICMP BLIND CONNECTION RESET + ICMP THROUGHPUT REDUCTION ATTACK** | *Network Security Project* **2021**
  - In a blind connection reset attack, the attacker makes the floor for blindly resetting TCP connection employing ICMP hard error messages.
  - In a throughput reduction attack, the attacker makes the floor for blindly reducing the throughput of a TCP connection utilizing choke packets.
  - Designed the attack using C language and observed through VM VirtualBox and Wireshark.

- **Ray Tracing** | *Graphics Project* **2021**
  - Generated realistic images for a few geometric shapes using ray tracing with Phong lighting models with a fully controllable camera
  - Implemented in **OpenGL**.

- **Online Math Learning Practice Site** | *Software Development Project* **2021**
  - Frontend built in **React.js** and Backend using **Node.js** and **Express.js**
  - Designed and implemented a database in **PostgreSQL**.

- **Line of Action** | *Artificial Intelligence Project* **2021**
  - Developed a Java-based two-player game
  - human vs human and AI vs human both playing types available

- Optimized using alpha-beta pruning algorithm

- **Solving 15 Puzzle** | *Artificial Intelligence Project* **2020**
  - Solving the sliding 15 puzzle using A* search algorithm and two heuristics- the Misplaced Tiles and the Manhattan Distance
  - Implemented the algorithm using **JAVA**

- **Dinosaur Game** | *Microcontroller Project* **2020**
  - The game is a simplified version of the hidden game from Chrome offline mode. Extra functionality of shooting enemies was added to the game.
  - Tools used were ATmega32, LED matrix, ICs, and Sound Sensor

- **Trip Management System** | *Database Project* **2019**
  - Frontend built using **PHP**
  - Designed and implemented a database in **PostgreSQL**

- **Air Hockey Game** | *Java Project* **2018**
  - Developed a Java-based two-player game using Java Socket for network Communication
  - UI built using Java Swing
  - Basic file system used to stored data

Interests

- Traveling, Reading, Watching Anime.