MD. NAZRUL HUDA SHANTO

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EDUCATION

Oklahoma State University   **Stillwater, Oklahoma, USA**
Master of Science -Computer Science; GPA: 3.80/4.00   *JAN 2024 - DEC 2025*

EXPERIENCE

Graduate Research Assistant–Department of Computer Science, Oklahoma State University

Supervisor: *Dr. Sharmin Jahan*, Assistant Professor, *Oklahoma State University*   *JAN 2024 - Present*

- Built a secure service mesh with Istio and Kubernetes to create a dataset of 500,000+ traffic logs for anomaly detection.
- Developed an ML-driven security system from the dataset using Flask APIs to detect malicious traffic and provide real-time attack explanation reports with LIME.
- Implemented adaptive security mechanisms using the to dynamically adjust services based on the explainable AI reports.

Junior Software Engineer–Tirzok Private Ltd.   **February 2023 - December 2023**
                                                                                            Dhaka, Bangladesh

Project: *Mortgage Management System.* **Client**: *Kramasoft* **Tasks**: *Automatic Document Validation*

- Implemented ML classifiers to identify document types, enhancing the system's ability to handle diverse document formats.
- Engineered a specialized ML document trimmer employing advanced classifiers to intelligently remove irrelevant pages from documents
- Developed robust data extraction processes using AWS Textract for various document types, ensuring the retrieval of crucial field values with precision.
- Built RESTful APIs using Spring Boot and PostgreSQL to facilitate auto validation processes.
- Integrated AmazonMQ (RabbitMQ) for seamless internal communication and Deployed in AWS Lambda using ECR.

Project: *Government-Citizen Interaction Portal.* **Client**: *Confidential* **Tasks**: *Citizen Portal, Role Management.*

- Crafted RESTful APIs for the citizen portal using Node.js and MongoDB.
- Architected a robust Role Management System using JWT authentication, Node.js, and MongoDB, ensuring secure and tailored access control.

Project: *Payroll and Tax Management System.* **Client**: *Payconz.* **Tasks**: *Multi Currency Convertion.*

- Developed a Flask-based currency conversion API integrated with PostgreSQL, facilitating real-time multi-currency payroll processing.
- Implemented APIs to generate comprehensive currency history reports for preceding months.

Undergraduate Research Assistant–BRAC University   **Remote**

Lab: Computing for Sustainability and Social Good (C2SG) Lab   *October 2020 - January 2023*

Supervisor: *Jannatun Noor*, Assistant Professor, *Brac University.*

Consultant: *Prof. Dr. A. B. M. Alim Al Islam,* Professor, *Bangladesh University of Engineering and Technology.*

- Developed a novel framework for HCI4D researchers to approach HVECs in Andharmanik and Ruma, executing Linear Regression with SPSS to understand participants' needs.
- Performed descriptive analysis to identify barriers in indigenous education in Bandarban District, created multiple prototypes, and finalized Indigenous Primary Education (IPE) content in three local indigenous languages.
- Decreased user waiting time for progressive JPEG by 54% and image size by 27% without compromising image quality; tested image qualities using SSIM and analyzed results from custom and COCO Dataset.
- Emulated a blockchain network with 50 Nginx VM servers and used proxy servers to detect and mitigate 66.7% of DDoS attacks using memory management of the VMs.

TECHNICAL SKILLS

Languages: Java, Python, JavaScript, SQL.
AWS Tools: Textract, Lambda, ECR, Opensearch, AmazonMQ, Secret Manager, S3, HTTP APIs.
Backend Frameworks: Node.js, Django, SpringBoot, Flask
Machine Learning Platforms/Frameworks: TensorFlow, PyTorch.
Python Libraries: Scikit-learn, Fitz, OpenCV, Pandas, Matplotlib, Tkinter, Seaborn, Numpy.
Developer Tools: Git, Heroku, HTML/CSS, Bootstrap, Linux
Cloud and DevOps Tools: Kubernetes, Docker, VirtualBox, Istio

Projects

Tackling Sexual Harassment on Public Transport with Deep Neural Network *| Pytorch* [Link]

- Used kaggle dataset "Car License Plate Detection" for training and testing.

Devising Faster Video Streaming Architecture with Low Bandwidth Video Compression Techniques | [Link]

- This project is a part of the Research Proposal. Compared different codecs for live video streaming.
- Used FFmeg's libx264 for H.264, libx265 for H.265, and libvpx-vp9 for VP9. To compare qualities, used SSIM, PSNR, and VMAF. Tuned the settings in real-time functionality to imitate live video streaming.

BRACU-ResearcherHub *| Django, Bootstrap, PostgreSQL*[Link]

- Social media for BRAC University researchers to find collaborators. Researchers can create separate research labs within specific research areas. If other researchers find the lab interesting; they can join and comment on the lab. An efficient way to find the next research collaborator.
- Used Django for backend and HTML, CSS and, Bootstrap for frontend.

Imago *| Tkinter, Opencv* [Link]

- Beautify your pictures by using filters, cropping, rotating, and lots of other features.
- Used Opencv to transform images and Tkinter to create the Graphical User Interface.

Publications

- J. Noor, **M. N. H. Shanto,** J. J. Mondal, M. G. Hossain, S. Chellappan and A. B. M. A. A. Islam, "Orchestrating Image Retrieval and Storage over A Cloud System," in *IEEE Transactions on Cloud Computing* (**IEEE TCC**), doi: 10.1109/TCC.2022.3162790, March, 2022. [**Q1, Impact Factor: 5.938**] [PDF]

- **M. N. H. Shanto,** J. Noor, M. G. Z. A. Husna, and A. B. M. A. A. Islam, "Darkness under The Lamp: Shedding Light over Digital Divide And Its Consequences in The Little-Known Indigenous Communities Living over mountains in Bangladesh," in *CSCW 2025* [**Accepted for major revission**]. [PDF] *[Nominated for the second round (top 48.1%) in **CHI '24**]*

- F. F. Khan, N. M. Hossain, **M. N. H. Shanto**, S. B. Anwar and J. Noor, "Mitigating DDoS Attacks Using a Resource Sharing Network" in *2022 9th International Conference on Networking, Systems and Security (NSysS),* doi: 10.1145/3569551.3569560 [PDF]

- J. Noor, T. Azhar, S. S. Karmakar, **M. N. H. Shanto,** F. E. Jannat, S. M. B. Hossain, and A. B. M. A. A. Islam, "Leveraging Pre-Primary Education of Indigenous Communities in Bangladesh through Participatory and Iterative Development of Online Resources.," in *Information Technology for Development*, [***In Review.***] [PDF]

- N. Rashid, J. Saha, R. I. Prova, N. Tasfia, **M. N. H. Shanto,** J. Noor. (2022). "Towards Devising a Fund Management System Using Blockchain." in *International Journal of Computer Science & Information Technology (IJCSIT), 12 (18), 225-238.* doi: 10.5121/csit.2022.121820 [PDF]

- J. Noor, **M. N. H. Shanto,**M. G. Z. A. Husna, and A. B. M. A. A. Islam, "Towards Decolonizing HVECs-HCI: Multi Level Digital Divide of the little known highly vulnerable ethnic communities in Southeast Bandarban," in *CSCW2025* [**In Review**]. [PDF]

Research Achievements

- Presented "Mitigating DDoS Attacks Using a Resource Sharing Network" in **9th International Conference on Networking, Systems and Security (9th NSysS 2022)**, on 20th December, 2022.
- Presented poster "Orchestrating Image Retrieval and Storage over A Cloud System" **8th International Conference on Networking, Systems and Security, December 21-23, 2021 (8th NSysS 2021)**
- Invited to attend **2022 ACM International Joint Conference on Pervasive and Ubiquitous Computing (Ubicomp'22)**, September 11—15, Atlanta, USA and Cambridge, UK.
- Received partial funds from **"Bangladesh University of Engineering and Technology"** to conduct fieldwork in Andharmanik.
- Received **US National Science Foundation under Grant 2014547** to pay additional page charges for publishing "Orchestrating Image Retrieval and Storage over A Cloud System" in *IEEE Transactions on Cloud Computing.*
- Invited to present our work in ICCCN 2021 Workshops by **The 30th International Conference on Computer Communications and Networks (ICCCN 2021)**, July 19 - 22, 2021, Athens, Greece.