

MD. ISTIAK HOSSAIN SHIHAB

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SUMMARY

I am a machine learning researcher with expertise in natural language processing, speech recognition, and document layout recognition. Additionally, I possess several years of industry experience in backend development. I have authored several papers that have undergone peer review and been published in esteemed conferences and journals. Furthermore, I have actively participated and organized in various competitions and challenges related to my research interests. As a researcher, my current focus is on delving deeply into the interpretability of machine learning models and multimodal learning.

EDUCATION

B.Sc. in Computer Science & Engineering,

June '21

Shahjalal University of Science & Technology

CGPA: 3.61/4.00 (Last Two Years GPA: 3.91/4.00)

PUBLICATIONS

Peer-Reviewed Conference and Workshop Publications:

1. **MIH Shihab**, MR Hasan, MR Emon, SM Hossen, Md Ansary, I Ahmed, FR Rakib, SE Dhruvo, SS Dip, AH Pavel, MH Meghla, Md Haque, SS Chowdhury, F Sadeque, T Reasat, AI Humayun, AS Sushmit. 2023. [BaD-LAD: A Large Multi-Domain Bengali Document Layout Analysis Dataset](#).
Published at: *The 17th International Conference on Document Analysis and Recognition (ICDAR)*.
2. FR Rakib, SS Dip, S Alam, N Tasnim, **MIH Shihab**, MN Ansary, SM Hossen, MH Meghla, M Mamun, F Sadeque, SS Chowdhury, T Reasat, AS Sushmit, AI Humayun. 2023. [OOD-Speech: A Large Bengali Speech Recognition Dataset for Out-of-Distribution Benchmarking](#). Paper presented at the
Published at: *Interspeech 2023*.
3. **MIH Shihab** & N Tasnim & H Zunair, LK Rupty, N Mohammed. 2022. [VISTA: Vision transformer enhanced by U-Net and image colorfulness frame filtration for automatic retail checkout](#).
Published at: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*.
4. **MIH Shihab** & N Tasnim, AS Sushmit, S Bethard, F Sadeque. 2022. [TEAM-Atreides at SemEval-2022 Task 11: On leveraging data augmentation and ensemble to recognize complex Named Entities in Bangla](#).
Published at: *Proceedings of the 16th International Workshop on Semantic Evaluation*.
5. **MIH Shihab** & N Tasnim, M Rahman, SR Islam, MR Amin. 2021. [Exploring the Scope and Potential of Local Newspaper-based Dengue Surveillance in Bangladesh](#).
Published at: *Joint KDD 2021 Health Day and 2021 KDD Workshop on Applied Data Science for Healthcare*.
6. **MIH Shihab** & N Tasnim, M Rahman, JR Saurav, SR Islam, MR Amin. 2021. [Observing the Unobserved: A Newspaper Based Dengue Surveillance System for the Low-Income Regions of Bangladesh](#).
Published at: *The International FLAIRS Conference Proceedings 34*.
7. R Islam, RS Raju, **MIH Shihab**, N Tasnim, MA Bhuiyan, Y Araf, T Islam. 2021. [Choice of assemblers has a critical impact on de novo assembly of SARS-CoV-2 genome and characterizing variants](#).
Published at: *Briefings in Bioinformatics, Volume 22, Issue 5, September 2021*.
8. S Das, N Tasnim, **MIH Shihab**, MF Khan, RA Mahmud. 2021. [Team Passphrase: Dhaka AI Vehicle Detection Challenge](#).
Poster published at: *DhakaAi Traffic Detection Challenge*.

Ongoing Research:

1. [Bornil: An open-source sign language data crowdsourcing platform for AI enabled dialect-agnostic communication.](#) *Collaboration with Bengali.Ai and submitted to IJCNLP-AAACL 2023.*
2. [bbOCR: An Open-source Multi-domain OCR Pipeline for Bengali Documents.](#) *Collaboration with Bengali.Ai.*
3. Mapping Violence: Developing an Extensive Framework to Build a Bangla Sectarian Expression Dataset from Social Media Interactions. *Collaboration with Bengali.Ai*
4. BGEDCD: Bengali Grammatical Error Detection and Correction Dataset. *Collaboration with Bengali.Ai*
5. [Evaluation of the Potential Usage of Transformer based Models in Classification of Immunoglobulin B-cell Sequence.](#) *Collaboration with Dr. Ruhul Amin, Fordham University..*
<http://dx.doi.org/10.1093/bib/bbab102>

RESEARCH EXPERIENCE

Research Assistant, Bengali.Ai, Dhaka. Oct. '22 - Present

Projects: Bangla Sign Language Corpus and Bangla Speech Corpus

- Launched Kaggle featured competition on Bengali OOD ASR Modeling w. 53,000 USD prizemoney (Sponsored by Google).
- Launched DLSprint: Community research competition on document layout analysis
- Led data collection, annotation and curation efforts in 2 projects
- Led deep learning based modeling efforts in 4 projects. ASR, SLR, LM fine-tuning, Image Segmentation
- Published in INTERSPEECH 23, ICDAR 23. Submitted in IJCNLP 23 x2

Undergrad Research Assistant, XGenomics, Sylhet. Apr. '20 - June '20

Assigned Project: Choice of assemblers has a critical impact on de novo assembly of SARS-CoV-2 genome and characterizing variants.

- Performed benchmarking with four popular assemblers;
- Visualized assembled genome of SARS-CoV-2 and investigated anomalies;

PROFESSIONAL EXPERIENCE

Engineer, bKash Ltd, Dhaka.

Software Research and Engineering

Sept. '21 - Dec. '22

Backend Developer for the Largest Mobile Financial Service in Bangladesh with 50M+ customer base.

- Engineered a graph-based search navigation system for the internal CMS to improve search performance and user experience;
- Implemented and optimized archival and content upload and management systems to improve the efficiency and scalability of content management;
- Converted legacy services to reactive architecture, improving performance and scalability;
- Engineered a solution to inform and reward customers after completing several onboarding tasks, increasing customer satisfaction and retention;

Advanced Research Team

Jan. '23 - Sept. '23

- Oversaw and developed internal research and development of machine learning-based problems such as- OCR Engine and Spoof detection, leading to the development of new and innovative products and services.
- Proposed and initiated the idea of widget for faster payment processing.

Skills: *Spring Boot, PyTorch, DynamoDB, Redis, AWS, Docker*

Software Engineer, Android Development, Progoti Systems Ltd., Dhaka.

Apr. '21 - Aug. '21

Android Developer for Tallykhata, Accounting and Digital Credit Platform for MSME with 5 million Userbase.

- Worked on 'Cashbox' - a key feature that keeps track of the merchant's daily cash flow.;

- Worked with Android Deep Linking and App Linking to track campaign success and user attraction;
- Designed reusable complex dialogue components;

Skills: *Android Development, Room Database, MVVM*

Developer Internship, Pipilika, A Bengali Search Engine., Sylhet.

Apr. '20 - Sept. '20

- Developed crawlers in Scrapy covering major news outlets for news.pipilika.com;
- Developed APIs for scheduled update and analysis of Covid related data for Bangladesh;
- Developed backend APIs of corona.pipilika.com;

Skills: *React.js, Scrapy, Django*

PROJECTS

SUSTCast

[\[App\]](#), [\[Code\]](#)

Online radio platform for my university with an automated queuing (based on song popularity) system built on IceCast2 Server platform. The app is built with Firebase and is live on Playstore. I have worked on the Android App module and partly on the backend module.

Sentiment Analysis in Bengali

Android app designed to output the sentiment analysis and emotion of a given sentence or a paragraph, in collaboration with and commissioned by Gigatech Ltd. Used TFLite models to run the inference on a device if the internet is not available and used a flask-based backend API to run the inference if the internet is available. I have worked on the app module.

Shaako

[\[Frontend\]](#) [\[Backend\]](#)

NGO Management and Content Delivery platform built on Azure Stack, submitted to the Microsoft Imagine Cup contest, where we became one of the regional finalists. The app is built for the Android platform, using CosmosDB and Azure Authentication service for User management. In the backend, Content is delivered using a Django server and served with Rest APIs. I have worked on both the app and the backend module.

Peer to Peer

[\[Code\]](#)

A peer-to-peer chat and file-sharing android app that connects two device on the same network or devices with public IP, using their IP addresses and designated port numbers. It uses Java Socket to communicate with each other. Used OOP and Software design principles to ensure fast connectivity, data management, and modular system design.

OPENSOURCE CONTRIBUTION

Detecto

[\[Repository\]](#)

It is a Python package that allows you to build fully-functioning computer vision and object detection models with just 5 lines of code. Submitted and Merged PR #66 suggesting an improvement on its XML Parser for VOC XML files.

LEADERSHIP EXPERIENCE

RoboSUST, Shahjalal University of Science & Technology

Sylhet

Vice President (Research & Development)

Jan. '20 - June '21

- Founded and Developed a radio station for SUST Campus.
- Worked on an autonomous vehicle project, Funded by University authority.
- Took training workshops on the basics of robotics.

Research and Development Project Manager

Jan. '19 - Dec. '19

- Oversaw the implementation of security automation system of club room.

Office Secretary

Jan. '18 - Dec. '18

- Organized a national festival on Robotics and Olympiad competitions.

SUST Science Arena

Vice President (Academic)

Sylhet

May '20 - Apr. '21

- Organized multiple national level general knowledge and Olympiad competitions participated by over 200+ participants.

ACHIEVEMENTS

- 2022 **3rd Place Score** among 27 teams, Track-4. The 6th AI City Challenge Workshop at CVPR
- 2022 **Regional Finalist**, Microsoft Imagine Cup, 2022
- 2020 **4th Place Score** among 242 Teams, Dhaka AI, AI Based Dhaka Traffic Detection Challenge
- 2020 Participated at the **MIT Global Community Bio Summit 2020**.

TECHNICAL SKILLS

Languages	Java, Python, JavaScript, C++, Dart, HTML, CSS, SQL, Go, Assembly
Frameworks	Spring Boot, Android, Django, Flask, Arduino, Flutter, React
Machine Learning	PyTorch, OpenCV
Databases	MySQL, DynamoDB, Firebase, Apache Solr
OS	Linux, MacOS, Windows, Headless Raspbian
Software & Tools	\LaTeX , Bash, MS Office, Canva, Gimp