

# Md.Ariful Islam

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## Research Interests

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Machine Learning, Deep Learning, High-Performance Computing(HPC), Heterogeneous systems, Natural Language Processing, Computer Vision, Image processing.

## Education

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**Bachelor of Computer Science and Engineering** Jan 2018 - Aug 2023

Chittagong University of Engineering and Technology, Bangladesh.

- GPA: 3.21/4.0 ([Transcript](#) 🔗)
- **Coursework:** Computer Architecture, Artificial Intelligence, Data Structure, Algorithm, etc.

## Publications

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Islam, M., Ahasan, S., Hoque, M.M: **TranSenA: A Transformer-based Framework for Sentiment Analysis of Restaurant Reviews**. Accepted in International Conference on Signal Processing, Information, Communication and Systems([SPICSCON'2024](#) 🔗).[Accepted]

## Research Activities

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**CUET NLP LAB** July 2024 - Present

*Research Fellow*

- Developing a multimodal restaurant review dataset for accurately express the sentiment.
- Developing a generalized Bengali dataset for sentiment classification including movie reviews, Airplane service.

**CUET NLP LAB** Jan 2023 - June 2024

*Undergraduate Student Researcher*

- **Dataset Development:** Collaborated in datasets tailored for low-resource languages: (1) BEmoLex(Bangla Emotion Lexicon Dataset) for emotion detection and (2) a restaurant review dataset (BRRD) containing 11004 Bengali restaurant reviews of three types positive (5622), negative (4402), and neutral (980).
- Investigated performance of various ML, DL, and transformer based models for sentiment analysis of restaurant reviews from Bengali Text.
- Achieved remarkable results with 0.90 F1 score surpassing previous multiclass sentiment analysis restaurant review detecting models.

## Experience

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**Software Engineer** Milpitas, CA

*FSM(Frontier Semiconductor Metrology)*

*June 2023 – Present*

- Reduced time for Semiconductor wafer Roughness calculation for a stack of 800 images from 8 mins to 9 Seconds using GPGPU **CUDA C++**.
- Implementing parallel processing using NVIDIA GPU for faster stress, and smoothness measurement in semiconductor wafer.
- Implemented OCR(Optical Character Recognition) to track the wafer ID from wafer Image to trace the wafer more accurately.
- Analyze data and render 2D, 3D views for better understanding.
- Build Desktop application using MFC C++.

**Software Engineer Intern**

*SELISE Digital Platforms*

*Dhaka*

*Oct 2022 – Nov 2022*

- Designed and developed an E-commerce website using Angular, NodeJS, and MongoDB ([Github](#) 🔗)

## Test Score

### Graduate Record Examinations (GRE)

Sept 2024

Score: 309 (Quantitative: 161, Verbal: 148, Analytical Writing: 3.0)

## Selected Projects

### HPC and image processing

(Github) [↗](#)

It has high-speed machine vision cameras for massive amounts of image processing in real-time with **CUDA C++** and high-performance computing (HPC) capability with complex embedded systems for measurement.

### Rock Paper Scissor

(Github) [↗](#)

Created a real-time gesture recognition game using OpenCV and MediaPipe to classify hand gestures (rock, paper, scissors) for interactive gameplay. Optimized for smooth, real-time user interaction and dynamic responses.

### Optical Character Recognition

Implemented an OCR system to detect wafer IDs written in semifont. Leveraged K-Nearest Neighbors (KNN) for accurate pattern matching and the identification of the nearest character match. Before the identification raw image is processed with several image processing techniques written in C++.

### Vocal-Sheild

VocalSheild Bangla leverages the Whisper speech-to-text model to transcribe Bengali voice data into text and runs a custom abusive language detection algorithm on the output. This project is focused on safeguarding Bengali conversations in public forums, social platforms, and personal use, ensuring that offensive or harmful speech is detected. (Ongoing)

### Data Analyzer

(Github) [↗](#)

A basic understanding of all MFC C++ features. A chart is generated by selecting two columns from a CSV. The selected values can be transferred and saved into a pdf file.




## Honors and Awards

- **Undergraduate Merit Scholarship, CUET** 2019-2024
- **Bangladesh Education Board Scholarships**
  - Higher Secondary School Certificate (HSC) Talentpool Scholarship Award 2017
  - Secondary School Certificate (SSC) Talentpool Scholarship Award 2015
- **International Collegiate Programming Contest (ICPC)** [Link](#) [↗](#) 2020-2024
  - 161<sup>st</sup> among 1400+ teams in 2021-2022
  - 408<sup>th</sup> among 1300+ teams in 2020-2021 with Honorable Mention
- **Participated in National Collegiate Programming Contest (NCPC)** [Link](#) [↗](#) 2020
- Top 40% in **Google Code Jam** competition [Link](#) [↗](#) 2020-2023
- Top 30% in **Google Kick Start** competition [Link](#) [↗](#) 2020-2023
- Reached 2<sup>nd</sup> round in **Facebook Hacker Cup** [Link](#) [↗](#) 2022

## Technical Skills

<b>Expertise</b>	: ML, DL, NLP, HPC, GPGPU
<b>Open-source Libraries</b>	: Keras, TensorFlow, Pandas, PyTorch, NumPy, Scikit-Learn, Matplotlib
<b>Software Development Skills</b>	: HTML, CSS, MFC, Git, MongoDB
<b>Languages</b>	: C, C++, Python, JavaScript, SQL

Solved 1200+ competitive programming problems in different online platforms as part of my preparation for programming contests (ICPC, NCPC, etc).

- **Codeforces** Solved 950+ problems ([ai\\_an1k](#) )
- **Leetcode** Solved 350+ problems ([maang5](#) )
- **Codechef** Solved 80+ problems ([anik1652](#) )

## Selective Training and Workshops

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- **Computational Linguistics Bangla Language Processing** - 2nd International Workshop on CLBLP
- **AI and Machine Learning with Python** - SKBIT, CUET

## Leadership Experiences

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<b>CUET NLP Lab</b> <i>Lab Member</i>	Jan 2023 - Present
<ul style="list-style-type: none"> <li>◦ Meet bi-weekly with junior undergrads working in CUET NLP Lab. Discuss research problems, share ideas, and track progress.</li> <li>◦ Teach students the basics of deep learning and NLP.</li> </ul>	
<b>Competitive Programming Club, CUET</b> <i>Programming Coordinator</i>	2021-2023
<ul style="list-style-type: none"> <li>◦ Teach students advanced data structures, number theory, and algorithms.</li> <li>◦ Organize contests, keep track of individual performance, and form teams.</li> </ul>	
<b>Greater Cumilla Student Welfare Association</b> <i>Member</i>	2018-2024
<ul style="list-style-type: none"> <li>◦ Acted as a student representative and collaborated with academia and departmental service.</li> <li>◦ Assisted in medical fundraising for critical students.</li> </ul>	