

Md. Asif Haider

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RESEARCH INTEREST

Natural Language Processing, Software Engineering, Deep Learning, Computational Social Science

EDUCATION

- **Bangladesh University of Engineering and Technology (BUET)** Apr 2019 - Present
BSc. in Computer Science and Engineering (Expected Graduation: June 2024) Dhaka, Bangladesh
 - CGPA (7/8 semesters): 3.68/4.00 [Latest semester: 3.92/4.00]
 - Dean's list award and university merit scholarship recipient in levels 2 and 4
- **Notre Dame College (NDC)** Jul 2016 - Oct 2018
Higher Secondary School (Science) Dhaka, Bangladesh
 - GPA: 5.00/5.00
 - Board talentpool scholarship recipient, NDC honorable mention awardee

RELEVANT COURSEWORK

Machine Learning, Artificial Intelligence, Bioinformatics, Software Engineering, Information System Design, Computer Security, Operating Systems, Computer Networks, Data Structures and Algorithms, Database Systems, Computer Graphics, Numerical Methods, Discrete Mathematics, Object Oriented Programming

PUBLICATIONS AND RESEARCH EXPERIENCE

- **Source Code Translation and Bug Generation with Large Language Models** May 2024 - Present
Summer Research Internship (Remote), University of Illinois at Urbana-Champaign (UIUC), USA
 - Studying automatic code translation and source code bug (mutant) generation using LLMs
 - **Supervisor:** Dr. Darko Marinov, Professor, CS, UIUC; Dr. Reyhaneh Jabbarvand, Assistant Professor, CS, UIUC
- **Prompt Engineering and Finetuning of LLMs for Code Review and Repair Generation** Jul 2023 - Present
Undergraduate Thesis (Ongoing), NLP Group, CSE-BUET
 - Designing memory efficient hard prompt using static program metadata (function call graph) and natural language summary with human evaluation to improve code review and code refinement generation tasks
 - **Tools and Technology:** Python (Pytorch), TreeSitter, OpenAI GPT API, CodeT5, CodeReviewer, CodeLlama
 - **Supervisor:** Dr. Anindya Iqbal, Professor, CSE, BUET; Dr. Toufique Ahmed, PostDoc, CS, UC Davis
- **Zero-shot Prompting for Code Complexity Prediction Using GitHub Copilot** Mar 2023 - May 2023
IEEE/ACM 2nd International Workshop on Natural Language-Based Software Engineering at ICSE 2023
 - Analyzed the effectiveness of zero-shot prompting for code complexity prediction using GitHub Copilot
 - Performed data cleaning, statistical analysis and visualizations [\[Publication Link\]](#)
 - **Tools and Technology:** Python (Numpy, Pandas, Matplotlib, Scikit-learn)
 - **Supervisor:** Mohammed Latif Siddiq, Graduate Research Assistant, CSE, University of Notre Dame, USA
- **Forecasting COVID-19 cases: A Comparative Analysis between RNNs and CNNs** Sep 2020 - Apr 2021
Elsevier Results in Physics, Volume 24, 2021, 104137, ISSN 2211-3797, **Impact Factor: 5.3**
 - Co-authored a research article on comparative performance analysis between different recurrent and convolutional neural network models for time series COVID-19 data to forecast death cases [\[Publication Link\]](#)
 - **Tools and Technology:** Deep Learning (LSTM, GRU), Python (Tensorflow, Keras, Seaborn)
 - **Supervisor:** Khondoker Nazmoon Nabi, Doctoral Candidate, School of Public Health, Harvard University

• Investigating Signal Processing and Memory Potential in Detached Inert Brains

Mar 2021 - Present

Undergraduate Voluntary Research Project, Next-generation Computing Lab, CSE-BUET

- Co-authored a manuscript for submission on processing signal in inert goat brains with response to external stimuli
- Performed microcontroller interfacing, visualization, and regression analysis
- **Tools and Technology:** Arduino, Python
- **Supervisor:** Dr. A. B. M. Alim Al Islam, Professor, CSE, BUET

RESEARCH AND TRAVEL GRANTS

- **ACM SIGPLAN PLMW:** Travel Grant to attend the **PLDI 2024** Conference at Copenhagen May 2024
- **RISE Student Research Grant:** Undergraduate **Thesis Grant** centrally awarded by University Oct 2023
- **ACM SIGHPC Immersion:** Travel Grant to attend the **SC 2022** Conference at Dallas, Texas Sep 2022

COMPETITIONS AND AWARDS

- **BME-BUET BioMed Datathon Runner Up:** Disease Detection from Heart Sound [\[Report Link\]](#) Feb 2024
- **Deep Learning Enigma 1.0 Finalist:** Road Object Detection Contest for Autonomous Driving Jan 2024
- **IEEE Video and Image Processing Cup Champion:** Ophthalmic Biomarker Detection [\[Arxiv Link\]](#) Nov 2023
- **BUET CSE Fest Hackathon Champion:** Devops Category Software Development Group Project Aug 2022
- **Student Research Poster Champion:** 8th NSysS 2021 Conference [\[Poster Link\]](#) Dec 2021
- **NDC Honorable Mention Award:** Distinction in Academic and Extracurricular activities Jan 2018
- **BDMO Runner Up:** Bangladesh Mathematical Olympiad, Dhaka Regional Jan 2017

SKILLS

- **Spoken Languages:** English (Professional), Bengali (Native)
- **Programming Languages:** Python, C/C++, Java, JavaScript, SQL, HTML/CSS, Shell, 8086 Assembly
- **Developer Tools:** PyTorch, LaTeX, Git, Docker, Linux, Visual Studio Code, Google Colab, Kaggle

INDUSTRY EXPERIENCE

- **OpenRefractory, Inc. Bangladesh** Nov 2023 - Dec 2023
Software Engineering Intern Dhaka, Bangladesh
 - Completed a month-long internship program on **Bug Fixing in Open Source Software Projects**
 - Studied python security bugs and triaged SAST tool results according to the CWE standards
 - Created bug-fixing documentation and maintained the GitHub Pull Requests with the project managers
 - **Manager:** Dr. Munawar Hafiz, Founder and CEO, OpenRefractory, Inc.

ACADEMIC PROJECTS

- **Vehicle Object Detection in the Context of Bangladesh Road Traffic** Jan 2024 - Feb 2024
Machine Learning Course Project [\[Project Link\]](#)
 - Performed exploratory data analysis and data augmentation
 - Finetuned vision **transformer** based modern deep learning models (YoloV6L6, YoloV8, RT-DETR, CoDETR)
 - Evaluated on **BadODD** and **DhakaAI**, two novel road traffic object detection dataset curated for Bangladesh
 - **Tools & Technology:** Python (PyTorch), Ultralytics YOLO, Pandas, Tensorboard, MMDetection
- **Multi-label Heart Disease Prediction from Heart Sound Recording** Jan 2024 - Feb 2024
BME-BUET Datathon Kaggle Competition Project [\[Project Link\]](#)
 - Performed exploratory data analysis and augmentation, imbalance handling, audio feature extraction and selection
 - Implemented and evaluated classical machine learning models (decision tree, random forest, xgboost)
 - Trained and evaluated modern deep learning models (multi-layer perceptron, audio spectrogram **transformer**)
 - **Tools & Technology:** Python (PyTorch), Scikit-learn, Numpy, Pandas, Matplotlib, HuggingFace

- **Beyond The Seas (Unified Higher Study Admission Portal)** Jul 2023 - Sep 2023
Information System Design and Software Development Course Project [\[Project Link\]](#)
 - Built full stack web application with service-oriented architecture, version control, and API documentation
 - **Tools & Technology:** Python (Flask), JavaScript (NextJS), PostgreSQL, MaterialUI, AWS Cloud, Git, Swagger
- **Cryptography and Malware Analysis** Jul 2023 - Sep 2023
Computer Security Course Assignments [\[Repository Link\]](#)
 - Implemented cryptography (AES, Diffie Hellman, RSA) algorithms, and pedagogical malware functionalities
 - **Tools & Technology:** Python, Docker, Azure Cloud, TigerVNC
- **Packet Tracer and Network Simulator** Dec 2022 - Feb 2023
Computer Networks Course Assignments [\[Repository Link\]](#)
 - Implemented server-client socket programming, designed LANs, and simulated wireless networks
 - **Tools & Technology:** Java, Cisco Packet Tracer, Network Simulator 2 (NS2)
- **BookKeep (Online Book Store Platform)** Dec 2021 - Feb 2022
Database Course Project [\[Project Link\]](#)
 - Developed an MVC web application with raw SQL queries and version control
 - **Tools & Technology:** HTML5, CSS3, Javascript, Bootstrap, Python (Django), Oracle, Git

LEADERSHIP ACTIVITIES

- **IEEE Computer Society BUET Student Branch Chapter** Mar 2021 - Present
Vice Chairperson (Strategy) Dhaka, Bangladesh
 - Organized national-level programming contests and hackathon competitions
 - Hosted research talks, software development seminars, and workshops

REFERENCES

- **Dr. Anindya Iqbal** Email: anindya@cse.buet.ac.bd
Professor, CSE-BUET [Thesis Supervisor]
- **Dr. A. B. M. Alim Al Islam** Email: alim_razi@cse.buet.ac.bd
Professor, CSE-BUET [Research Advisor]