Md. Asif Haider

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Research Interest

Natural Language Processing, Software Engineering, Machine Learning, Human-Computer Interaction

Education

- **Bangladesh University of Engineering and Technology (BUET)** Apr 2019 - Present
  BSc. in Computer Science and Engineering (Expected Graduation: May 2024) Dhaka, Bangladesh
  - CGPA (7 out of 8 semesters): **3.68/4.00**
  - Dean's list award and university merit scholarship recipient

- **Notre Dame College (NDC)** Jul 2016 - Oct 2018
  Higher Secondary School Dhaka, Bangladesh
  - GPA: **5.00/5.00**
  - Talentpool scholarship recipient

Publications

- **Zero-shot Prompting for Code Complexity Prediction Using GitHub Copilot**
  IEEE/ACM 2nd International Workshop on Natural Language-Based Software Engineering **(NLBSE) at ICSE 2023**
  - **Authors:** Mohammed Latif Siddiq, Abdus Samee, Sk Ruhul Azgor, **Md. Asif Haider**, Shehabul Islam Sawraz, Joanna C. S. Santos [Publication Link]

- **Forecasting COVID-19 cases: A comparative analysis between recurrent and convolutional neural networks**
  Elsevier Results in Physics, Volume 24, 2021, 104137, ISSN 2211-3797, **Impact Factor: 4.565**
  - **Authors:** Khondoker Nazmoon Nabi, Md Toki Tahmid, Abdur Rafi, Muhammad Ehsanul Kader, **Md. Asif Haider** [Publication Link]

Research Experience

- **Prompt Engineering and Finetuning of LLM for Software Engineering Generative Tasks** 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
  - **Supervisor:** Dr. Anindya Iqbal, Professor, BUET, **Collaborator:** Dr. Toufique Ahmed, PostDoc, UC Davis
  - **Tools and Technology: Python (Pytorch), TreeSitter, OpenAI GPT API, CodeLlama, CodeT5**

- **Code Complexity Prediction: Zero-shot Prompting** Mar 2023 - May 2023
  Visting Research Assistant, Security and Software Engineering (S2E) Lab, University of Notre Dame
  - Analyzed the effectiveness of zero-shot prompting for code complexity prediction using GitHub Copilot
  - Performed data cleaning, statistical analysis and visualizations
  - **Supervisor:** Mohammed Latif Siddiq, Graduate Research Assistant, University of Notre Dame
  - **Tools and Technology: Python (Numpy, Pandas, Matplotlib, Scikit-learn)**

- **Forecasting COVID-19 Cases: Comparing RNNs and CNNs** Sep 2020 - Apr 2021
  Undergraduate Voluntary Research Project
  - 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
  - **Supervisor:** Khondoker Nazmoon Nabi, Doctoral Candidate, Harvard T.H. Chan School of Public Health
  - **Tools and Technology: Deep Learning (LSTM, GRU), Python (Tensorflow, Keras, Seaborn)**

Open Source Contribution

- **OpenRefactory, Inc.** Nov 2023 - Dec 2023
  Software Engineering Intern Dhaka, Bangladesh

  – Completed a month-long internship program on intelligent **Secure Software Engineering**
  – Studied, triaged, and fixed open-source python security bugs according to the CWE standards
  – Created bug-fixing documentation and had the pull requests accepted by the project managers
  – **Supervisor:** Dr. Munawar Hafiz, Founder and CEO, OpenRefactory, Inc.

Awards and Achievements

- **IEEE Video and Image Processing Cup Champion:** Opthalmic Biomarker Detection [Arxiv Link] Nov 2023
- **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
- **BUET CSE Fest Hackathon Champion:** Devops Category Software Development Group Project Aug 2022
- **Dean's List Award and University Merit Scholarship:** Distinction in Academics May 2022
- **Student Poster Champion:** 8th International Conference on Networking, Systems, and Security Dec 2021
- **BASIS National ICT Award:** Tertiary Student Project Category Winner Jun 2020
- **Talent Pool Scholarship:** Outstanding academic result in Higher Secondary Certificate Exam Nov 2018
- **NDC Honorable Mention Award:** Distinction in Academic and Extracurricular activities Jan 2018
- **Bangladesh Math Olympiad Runner Up:** Dhaka Regional Mathematical Olympiad Jan 2017

Skills

- **Spoken Languages:** English (Professional), Bengali (Native)
- **Programming Languages:** Python, C/C++, Java, JavaScript, SQL, HTML/CSS, Shell, 8086 Assembly
- **Developer Tools:** LaTeX, Git, Docker, Linux, Visual Studio Code, Google Colab, Kaggle
- **Designing:** Figma, Canva
- **Performing Arts:** Theatre, Anchoring, Public Speaking

Relevant Coursework

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

Organizations and Affiliations

- **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

- **BUET Career Club** Feb 2021 - Present
  Assistant General Secretary (Top Management) Dhaka, Bangladesh

  – Arranged educational and corporate knowledge-sharing sessions at the national level
  – Facilitated business competitions and industry internship programs