Soham Khisa

 Github | Linkedin | Email | Google Scholar | +880-1890311264

RESEARCH INTEREST

Deep Learning, Cyber-Physical Systems, Computer Vision, Natural Language Processing

PUBLICATION AND PREPRINT

- Aunabil Chakma*, Aditya Chakma*, **Soham Khisa***, Chumui Tripura*, Masum Hasan, and Rifat Shahriyar, "ChakmaNMT: A Low-resource Machine Translation On Chakma Language". [**EMNLP2024** @ Workshop on Asian Translations] [Preprint]

- **Soham Khisa**, Avijoy Chakma, "Enhancing Performance in Addressing Data Distribution Heterogeneity for Human Activity Recognition" [*under double-blind review* @ **PerCom2025**]

RESEARCH PROJECT

- Low-resource Machine Translation On Chakma Language   Oct 2021 - Sept 2024
  - Core contributor in training **BanlgaT5** with back-translation
  - Achieved BLEU of **17.8** & **4.41** in CCP-BN & BN-CCP on the test-set (**higher from typical low-resource works**)
  - Collabs: A. Chakma (U of Arizona), A. Chakma, C. Tripura, Prof. R. Shahriyar (BUET), and M. Hasan (U of Rochester)

- Addressing Data Distribution Heterogeneity in Human Activity   Nov 2023 - Sept 2024
  Recognition via Wearable Devices
  - Outperforms baselines by **3-15**% across different data distribution heterogeneities.
  - Proposes a novel approach that combines probabilistic mapping with self-supervised learning.
  - Collab: Prof. A. Chakma (Bowie State University)

- A New Approach to Address the Novel Class Discovery Problem   Jan 2024 - Present
  - Collabs: A. Dewan (BUET), Prof. A. Chakma (Bowie State University)

- Knowledge Graph-Based Categorization of Newspaper Articles   Apri 2022 - May 2023
  in a Newspaper Corpus
  - Collab: I. B. Mahmod (BUET)

PROFESSIONAL EXPERIENCE

Research Assistant (Remote)   Sept 2023 - Present
Bowie State University, MD, USA (Remote)
I'm currently working with Dr. Avijoy Chakma at Bowie State University, focusing on machine learning for ubiquitous computing. I also explore applied machine learning and AI fields, including computer vision and LLMs. My responsibilities include:

- Conducting literature reviews
- Processing and analyzing data
- Implementing research ideas
- Assisting with research experiments
- Attending research meetings and discussions
- Contributing to research publications

EDUCATION

- **Bangladesh University of Engineering and Technology (BUET)**   2018 - 2023
  BSc in Computer Science and Engineering

  Thesis: Knowledge Graph-Based Categorization of Newspaper Articles in a Newspaper Corpus [PDF]
  Advisor: Dr. Muhammad Masroor Ali

Undergraduate Lab Projects (Selected)

- **CNN From Scratch**
  Deep Learning Project
  - **Libraries:** opencv, matplotlib, tqdm, pandas, pickle, scipy
  - **Architecture:** Convolutional Neural Network (LeNet)
  - **Description** The objective was to develop CNN-LeNet architecture from scratch (Using a very limited number of libraries). The codes can be found in this GitHub repository.

- **Retinal Disease Classification**
  Deep Learning Project
  - **Frameworks & Libraries:** numpy, matplotlib, pandas, PyTorch
  - **Architecture:** Restricted Boltzmann Machine, Convolutional Neural Network (AlexNet)
  - **Description:** The project's objective is to use retinal images to recognize and classify various retinal illnesses, including age-related macular degeneration and diabetic retinopathy. Codes and further details about this project can be found in this repository.

- **Auc-dais**
  Software Development Project
  - **Frameworks & DBMS:** Spring Boot, React, Bootstrap, PostgresSQL
  - **Description:** This is a web application for an online auction platform system that allows users to list items for auction, and bidders can browse and select the items they wish to bid on. The front end of the project can be found on this GitHub repository. The back end is this repository. A video demonstration of this project is available here.

Achievements and Awards

- Technical **Scholarship** by Bangladesh Government (2018-2023) for **outstanding results** in Higher Secondary School.

- Chittagong Hill Tracts Development Board **scholarship** in 2021 (**Top 0.1**% of Chittagong Hill tracts, Bangladesh)

- Rangamati Hill District Council Scholarship in 2020 (**Top 0.5%** of Rangmati District, Bangladesh)

- Finalist - MIST Inter-university ICT Innovation Fest, 2021

- Finalist - HackNSU season 3, 2021

Skills

- **Programming Languages:** Python, Java, C, C++, C#, Assembly
- **Machine Learning Frameworks/Libraries:** PyTorch, TensorFlow, NumPy, scikit-learn, Pandas, Keras
- **Database Management:** SQL (Oracle, Postgres, MySQL, SQLite)
- **Software Development:** Django, Spring Boot, React, JavaFX, Bootstrap
- **Version Control:** Git, GitHub
- **Operating Systems:** Linux, Windows, Mac
- **Scripting:** LaTeX, HTML, Shell Script(Linux)

Certification

- **Workshop on AI in Public Health** at CHRF, supported by the Gates Foundation. [Certificate]   June 1, 2024

- **Deep Learning Specialization** by DeepLearning.AI on Coursera [Certificate]   Oct 30, 2020

- **Machine Learning Foundations: A Case Study Approach** by the University of Washington on Coursera [Certificate]   May 29, 2020

Co-curricular Activities

- Active Member of DRMC Science Club   2015 - 2017
- Member of Entrepreneurship Development Club, BUET   2018 - 2019

- **Speedcubing Contests**
  - 3×3 Rubik's cube competition, Dhaka Spring Open 2018, **Semifinalist**
  - Rubik's cube competition, DRMC 9th National Science Carnival-2016, **2nd position**
  - Rubik's cube competition, Holy Cross 13th Inter College Science Festival 2015, **2nd position**
  - Rubik's cube competition, SAGC Science Festival 2015, **3rd position**

Reference

- Dr. Avijoy Chakma (Research Advisor)

- Dr. Muhammad Masroor Ali (Undergrad Thesis Advisor)