

# Soham Khisa

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## RESEARCH INTEREST

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

## PUBLICATION AND PREPRINT

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- 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

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- 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 Recognition via Wearable Devices Nov 2023 - Sept 2024
  - 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 in a Newspaper Corpus Apri 2022 - May 2023
  - Collab: I. B. Mahmud (BUET)

## PROFESSIONAL EXPERIENCE

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### 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

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### – 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)

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- **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](#).

## ACHIEVEMENTS AND AWARDS

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- 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

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- **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:** L<sup>A</sup>T<sub>E</sub>X, HTML, Shell Script(Linux)

## CERTIFICATION

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- **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

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- 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, **2<sup>nd</sup> position**
  - Rubik’s cube competition, Holy Cross 13th Inter College Science Festival 2015, **2<sup>nd</sup> position**
  - Rubik’s cube competition, SAGC Science Festival 2015, **3<sup>rd</sup> position**

## REFERENCE

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- [Dr. Avijoy Chakma](#) (Research Advisor)
- [Dr. Muhammad Masroor Ali](#) (Undergrad Thesis Advisor)