Md Mohaiminul Islam

mmiemon@cs.unc.edu
Webpage LinkedIn Google Scholar GitHub

Research Interest

Machine Learning	Deep learning, multi-modal learning, self-supervised learning, large language modeling, vision-language modeling.
Computer Vision	Video understanding, long-range video modeling, egocentric video analysis.

Education

2021 – Present **Ph.D. in Computer Science**, 3*rd* Year, *UNC Chapel Hill*
Advisor: Gedas Bertasius
Courses: *Deep learning, Advanced Topics in Video Understanding, Self-Supervised Visual Representation Learning, Visual Recognition with Transformers, Connecting Language to Vision and Robotics.*

2014 – 2018 **B.Sc. in Computer Science and Engineering**
Bangladesh University of Engineering and Technology
Advisor: Shamsuzzoha Bayzid
CGPA 3.86/4.00 (3.93 final 2 years)

Experience

Jan 21 – Present **Graduate Assistant,** *UNC Chapel Hill*
I work with professor Gedas Bertasius on computer vision, video understanding, long-range video modeling, egocentric video analysis, self-supervised learning, transfer learning, and multi-modal deep learning.

May 22 – Aug 22 **Research Intern,** *Comcast AI*
Efficient Movie Scene Detection using State-Space Transformers. [pdf]

Apr 19 – Dec 20 **Lecturer,** *University of Asia Pacific*

Nov 18 – Mar 19 **Software Engineer,** *Samsung Research*

Jan 18 – Sep 18 **Software Engineer Intern,** *Reve Systems*

Research Publications

4 Long Movie Clip Classification with State-Space Video Models
M. Islam, G. Bertasius
In *European Conference on Computer Vision (ECCV)* 2022. [pdf]

3 Efficient Movie Scene Detection using State-Space Transformers
M. Islam, M. Hasan, K. Athrey, T. Braskich, G. Bertasius
In *ArXiv* 2022. [pdf]

2 Object State Change Classification in Egocentric Videos with Divided Space-Time Attention
M. Islam, G. Bertasius
In *1st Ego4D workshop, CVPR* 2022. [pdf]

1 COVID-DenseNet: A Deep Learning Architecture to Detect COVID-19 from Chest Radiology Images
M. Islam, T. Hannan, L. Sarker, Z. Ahmed
In *International Conference on Data Science and Applications (ICDSA)* 2022. [pdf]

Selected Projects

- **ViS4mer** — An efficient video classification model for long-range videos utilizing a transformer encoder and a novel-proposed multi-scale state-space decoder.
- **TranS4mer** — An efficient model to detect scene boundaries in long-range movies that uses a novel state-space self-attention (S4A) building block.
- **EgoOSCC** — A transformer architecture using the divided space-time attention mechanism that can detect object state changes in egocentric videos.
- **Audio2Video** — A conditional GAN approach to generate plausible videos from natural sounds. Proposed a 3D CNN model for video and CNN-RNN model for audio.
- **COVID-DenseNet** — A CNN-based model to detect COVID-19 from chest radiology images which can localize the critical regions of affected images using a GRAD-CAM-based module.
- **ProteinSeq** — A CNN-LSTM model with an attention mechanism to predict the three-dimensional structure of a protein from its amino acid sequence.
- **BenglaAI** — A CNN-based model for Bengali Handwritten Digit Recognition.
- **eMed-DNA** — Presented a proof-of-concept for efficient management of Electronic Health Records (EHRs) of a person inside his DNA sequence.
- **UniShare** — An academic resource-sharing platform developed using PHP, CodeIgniter framework, MySql, JavaScript, HTML, CSS, and XAMPP server.
- **PoliceBox** — An interactive server-client system developed using Java Swing, JavaFX, MySql, and Socket Programming to efficiently manage various services provided by the police.
- **C compiler** — A simple C compiler using Flex and Bison.

Skills

- **ML tools** — PyTorch, TensorFlow, Keras, Distributed training
- **Coding** — Python, Java, C, C++, Java HTML, XML, PHP, JavaScript, 80x86 Assembly.
- **Databases** — Oracle, MySQL, PostgreSQL, SQLite.
- **Web Dev** — Html, CSS, JavaScript, Android, Apache Web Server.
- **Hardware** — AVR Micro-controller, Arduino.
- **Simulators** — Nachos, Packet Tracer, Proteus, Matlab.
- **Misc.** — Lex, Yacc, Shell Script, LaTeX.

Miscellaneous Experience

Awards and Honors

- 2022 — **2nd place**, *Ego4D: Object State Change Clasification Challenge*, Ego4d Workshop, CVPR 2022.
- 2018 — **Champion Student Poster Award**, International Conference on Networking, Systems and Security, NSysS 2017.
- **9th place**. *Bengali Handwritten Digit Recognition Challenge*, Kaggle Competition 2018.
- 2016-18 — **Deans List Award**, Bangladesh University of Engineering and Technology.
- **University Merit List**, Bangladesh University of Engineering and Technology.

Leadership

- 2014-18 — **Class Captain** Bangladesh University of Engineering and Technology.