

Md Salman Shamil

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EDUCATION

School of Computing, National University of Singapore

Singapore

Master of Science (Research), Dept. of Computer Science

August 2022-January 2025

CGPA: 4.79/5.00

Thesis Topic: On the Utility of 3D Hand Poses for Action Recognition.

Advisor: Dr. Angela Yao

Bangladesh University of Engineering and Technology

Dhaka, Bangladesh

Bachelor of Science in Computer Science and Engineering

February 2016-February 2021

CGPA: 3.81/4.00 (Major CGPA: 3.95/4.00)

Thesis Topic: Revisiting Segmentation of Lung Tumor from CT Images.

Advisor: Dr. M Sohel Rahman

PROFESSIONAL EXPERIENCE

Lecturer

February 2025 – Present

Department of Computer Science & Engineering

United International University (UIU), Dhaka, Bangladesh

March 2021 – July 2022 (Previous tenure)

Teaching Assistant

August 2022 – December 2024

School of Computing

National University of Singapore, Singapore

RESEARCH INTEREST

Deep Learning, Computer Vision, Video Understanding

PUBLICATIONS & PREPRINTS

1. **Shamil, M.S.**, Chatterjee, D., Sener, F., Ma, S. and Yao, A., 2024, September. On the utility of 3d hand poses for action recognition. In *European Conference on Computer Vision* (pp. 436-454). Cham: Springer Nature Switzerland.
2. Farheen, F., **Shamil, M.S.**, Ibteahaz, N. and Rahman, M.S., 2022. Revisiting segmentation of lung tumors from CT images. *Computers in Biology and Medicine*, p.105385. *[Co-first author]*
3. **Shamil, M.S.**, Farheen, F., Ibteahaz, N., Khan, I.M. and Rahman, M.S., 2021. An Agent-Based Modeling of COVID-19: Validation, Analysis, and Recommendations. *Cognitive Computation*, pp.1-12.
4. Farheen, F., **Shamil, M.S.**, Rahman Jony, S.S., Ahmad, Z., Sojib, K.H., Chowdhury, A., Niaz Arifin, S.M., Sania, A. and Rahman, M.S., 2022. An Agent-Based Model for COVID-19 in Bangladesh. *medRxiv*, pp.2022-07. *[Co-first author]*
5. Habib, M., **Shamil, M.S.** and Rahman, M.S., 2021. Counting and Verifying Abelian Border Arrays of Binary Words. *arXiv preprint arXiv:2111.00259*.

ACADEMIC SERVICES

Served as a reviewer for CVPR (2025), ECCV (2024), BMVC (2024), CVPR Workshops (2024).

SELECTED RESEARCH PROJECTS

- **On the Utility of 3D Hand Poses for Action Recognition**, as part of M.Sc. thesis, *December 2022-December 2024*. Worked with Assoc. Prof. Dr. Angela Yao and Dr. Fadime Sener.
 - Developed HandFormer, a novel multimodal transformer, to efficiently recognize hand actions.
 - Proposed a factorized pose representation that can combine 3D hand poses with sparsely sampled RGB frames for high accuracy and efficiency.
 - Achieved new state-of-the-art performance on Assembly101 and H2O datasets, showcasing the utility of 3D hand poses for egocentric and multi-view action recognition.
- **True Random Number Generator as a Byproduct of DNA Storage Operation**, *August 2022-December 2022*. Worked with Asst. Prof. Dr. Djordje Jevdjic.
 - Proposed a method leveraging DNA sequencing to generate a free source of true random numbers, minimizing bias and achieving NIST compliance.
 - Developed and experimentally validated a practical approach for constructing truly random bit streams based on the order of DNA molecules during the readout process.
- **Segmentation of Lung Tumor from CT Images using Deep Learning**, as part of B.Sc. thesis. *September 2019-February 2021*. Worked with Prof. Dr. M. Sohel Rahman.
 - Worked on Lung-Originated Tumor Segmentation from Computed Tomography Scan (LO-TUS) Benchmark dataset.
 - Proposed a unique preprocessing technique by combining neighboring CT slices for context and wavelet transforms for texture analysis.
 - Experimented with several deep learning models and incorporated deep supervision in MultiResUNet for achieving the best results.
- **Agent-based Modeling of COVID-19**, *May 2020-May 2022*. Worked with Prof. Dr. M. Sohel Rahman.
 - Implemented and validated an Agent Based Model (ABM) with individual action details.
 - Examined the impacts of different interventions and the effectiveness of digital herd immunity.
 - Worked on a project to develop COVID-19 forecasting models and data-driven responses to address high-priority public health challenges in Aspire to Innovate (a2i). The project is implemented by the ICT Division and Cabinet Division of the Government of Bangladesh.

TEACHING EXPERIENCE

- **National University of Singapore (NUS)** *Singapore*
Assisted in conducting tutorials, grading assignments, and mentoring students as a Teaching Assistant at SoC, NUS.
 - **CS4243: Computer Vision and Pattern Recognition.** (Prof. Angela Yao) Designed and graded lab sessions, assignments, and other assessments. Assisted in coordinating logistical aspects.
 - **BT3017: Feature Engineering for Machine Learning.** (Prof. Ng Teck Khim) Conducted tutorial classes for teaching data handling and feature engineering. Evaluated assignments and provided consultation hours.
- **United International University (UIU)** *Dhaka, Bangladesh*
Taught undergraduate courses as a full-time lecturer. Responsibilities included curriculum development, assessments, and student mentorship.

- **Core Computer Science:** Operating Systems, Databases, Theory of Computation
- **Digital & Circuit Design:** Digital Logic Design, Digital System Design, Electrical Circuits
- **Advanced Topics in Computing:** Simulation & Modeling, Introduction to Bioinformatics

TECHNICAL SKILLS

Programming Languages: Python, C, C++, Java, C#, MATLAB, bash

Deep Learning Frameworks: PyTorch, TensorFlow, Keras

Data Science Libraries: NumPy, Pandas, SciKit-Learn, Matplotlib, Seaborn

Markup Languages: HTML, $\text{\LaTeX}$ **DBMS:** Oracle, MySQL

Others: Git, Django, OpenGL, Assembly (8086), Flex, Bison

AWARDS AND PRIZES

- NUS SoC Research Incentive Award (October 2023)
- NUS Research Scholarship (August 2022-December 2024)
- BUET Undergraduate University Merit Scholarship (2020)
- BUET Undergraduate Dean's List Scholarship (2020)
- First Runner-up, Math Olympiad (University Level), BUET Math Festival 2018
- First Runner-up, Puzzle Olympiad, BUET Math Festival 2018
- Champion, Puzzle and Logic Contest, BUET CSE DAY 2016
- Education board scholarships in SSC and HSC
- 5th place in National Round, 5th Bangladesh Physics Olympiad (BdPhO 2015)
- Second runner-up in National Round, 9th Bangladesh Mathematical Olympiad (BdMO 2011)

OTHER ACTIVITIES

- Academic team member, Bangladesh Physics Olympiad (BdPhO) 2018.
- Co-founder and trainer (2015-2016), Paradox Physics School, Chittagong. (A voluntary organization aimed at helping physics enthusiast school students to pursue physics olympiads)

REFERENCE

Associate Professor Angela Yao, Dean's Chair Associate Professor, School of Computing, National University of Singapore (ayao@comp.nus.edu.sg)

Professor M. Sohel Rahman, Professor, Department of CSE, BUET, ECE Building, West Palasi, Dhaka-1205, Bangladesh (msrahman@cse.buet.ac.bd)

Dr. Fadime Sener, Research Scientist, Meta Reality Labs, Zurich, Switzerland (sener@cs.uni-bonn.de)