Sayed Mehedi Azim

sayedmehedi.azim@rutgers.edu github.com/MehediAzim linkedin.com/in/sayedmehediazim

sites.google.com/view/sayedmehediazim

RESEARCH INTERESTS

Generative AI and deep learning for tissue image segmentation and quantification; Multimodal integration of multiomics data (WSI imaging, tabular, and transcriptomics); Explainable AI for biomedical applications

EDUCATION

RUTGERS UNIVERSITY, CAMDEN, NJ 08102, USA — 2022-Present

PhD Candidate, Center for Computational and Integrative Biology, GPA: 4.00/4.00 *Expected graduation: May 2026*

UNITED INTERNATIONAL UNIVERSITY, DHAKA, BANGLADESH — 2016-2020

Bachelor of Science in Computer Science and Engineering, GPA: 3.97/4.00

EXPERIENCES

GRADUATE RESEARCH ASSISTANT — Aug 2022 - Present

Machine Learning & Bioinformatics Lab, Rutgers University, Camden, NJ 08102, USA

- Building a comprehensive deep Learning pipeline for automating the identification of brain regions and quantification of neural cells from immunohistochemistry images in collaboration with the Corbett Lab.
- Building a deep learning-based pipeline to identify ribosomal RNA fragments binding sites from RNA sequence information alone in collaboration with the Grigoriev Lab.
- Devised, implemented, and documented experiments for identifying Peptide binding sites using Machine Learning in collaboration with the Fu Lab.
- Designed and implemented experiments pioneering the identification of rotten Cranberries from hyperspectral images, and wrote research articles with the findings in collaboration with the United States Department of Agriculture.
- Provided mentorship to five master's students during their dissertation research, working under the guidance of Dr. Iman Dehzangi.

GRADUATE TEACHING ASSISTANT — Aug 2022 - Present

Rutgers University, Camden, NJ 08102, USA

- Taught Fundamentals of Programming in Python to a class of ~70 in weekly lecture review and discussion sessions for seven semesters
- Designed course materials including study problems and exams. Graded problem sets and exams

MACHINE LEARNING ENGINEER — Mar 2021 - Aug 2022

Apurba Technologies Ltd, **Dhaka, Bangladesh**

- Research & Development of Bangla OCR system. Built the largest OCR system for Bangla language documents (*Borno*), under the Ministry of ICT, the Government of Bangladesh.
- Maintained and deployed multiple Machine learning pipelines on the AWS server.
- Built a Character-level Bangla OCR model for typewriter data with a CRR of 91%

JR. DATA SCIENCE ENGINEER — Oct 2020 - Feb 2021

CMED Health Ltd, Dhaka, Bangladesh

- Cleaned and organized raw health data of 1.3 million individuals, collected from rural setup of Bangladesh, incorporating important health vitals such as blood pressures, glucose level, SpO2, BMI, along with socio-demographic data (256 parameters).
- Used descriptive statistics to achieve a big-picture view, and analyzed exciting trends found in the data.

PUBLICATIONS

Journals (in review)

- **Azim, S. M.,** Suoto, C., Corbett, B., and Dehzangi, I. (2025). ROIsGAN: A Region Guided Generative Adversarial Framework for Murine Hippocampal Subregion Segmentation. arXiv preprint arXiv:2505.10687. (*Under review* in Experts Systems with Application)
- **Azim, S. M.,** Kumar**,** R., Corbett, B., and Dehzangi, I. (2025). Segmentation and Classification of Hippocampal Subregions using Multi-Task Generative Adversarial Networks. (*Under review in Neurocomputing*)
- Khalkhali, V., **Azim, S. M.,** Han, J., Huang,J., and Dehzangi, I. (2025). Functional Subpopulations of Hematopoietic Stem Cells and Multipotent Progenitors Classification Using Transfer Learning (*Under-review in IEEE TMI*)

- Eje, O. A., **Azim, S.M**, and Dehzangi, I. (2025). Explainable AI Applications in Healthcare: A Systematic Review. (Under-review in Artifical Intelligence in Medicine)
- Karim, T., Shaon, M. S. H., Sultan, M. F., **Azim, S. M.**, Dehzangi, I., ... and Akter, M. S., (2025). KANampyl: A Novel Kolmogorov-Arnold Network Framework for Accurate Prediction of AMPylation Sites in Fic Domain Proteins (Under review in Computers in Biology and Medicine)

Journals (Peer reviewed)

- Sultan, M. F., Karim, T., Shaon, M. S. H., **Azim, S. M.**, Dehzangi, I., Akter, M. S., ... and Bui, F. M. (2025). DHUpredET: A comparative computational approach for identification of dihydrouridine modification sites in RNA sequence. ***Analytical Biochemistry***, 702, 115828.
- Khalkhali, V., **Azim, S. M**., and Dehzangi, I. (2025). ExShall-CNN: An Explainable Shallow Convolutional Neural Network for Medical Image Segmentation. ***Machine Learning and Knowledge Extraction***, 7(1), 19.
- **Azim, S. M.,** Balasubramanyam, A., Islam, S. R., Fu, J., and Dehzangi, I. (2024). Explainable machine learning model to accurately predict protein-binding peptides. ***Algorithms***, 17(9), 409.
- **Azim, S. M.,** Spadaro, A., Kawash, J., Polashock, J., and Dehzangi, I. (2024). Accurately identifying sound vs. rotten cranberries using convolutional neural network. ***Information***, 15(11), 731.
- **Azim, S. M.,** Sabab, N. H. N., Noshadi, I., Alinejad-Rokny, H., Sharma, A., Shatabda, S., and Dehzangi, I. (2023). Accurately predicting anticancer peptide using an ensemble of heterogeneously trained classifiers. ***Informatics in Medicine Unlocked***, 42, 101348.
- **Azim, S. M.,** Sharma, A., Noshadi, I., Shatabda, S., and Dehzangi, I. (2022). A convolutional neural network based tool for predicting protein AMPylation sites from binary profile representation. ***Nature Scientific reports***, 12(1), 11451.
- **Azim, S. M.,** Haque, M. R., and Shatabda, S. (2021). Oric-ens: A sequence-based ensemble classifier for predicting origin of replication in S. cerevisiae. ***Computational Biology and Chemistry***, 92, 107502.

Conferences

- **Azim, S. M.,** Kumar, R., Corbett, B., and Dehzangi, I. (2025). MT-UGAN: Multi-task GANs for Automatic Segmentation and Identification of Hippocampal Regions. The 16th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB) (*Poster*)
- Khalkhali, V., **Azim, S. M**., Han, J., Huang, J., and Dehzangi, I. (2025). ExShall-CNN: Toward Automated and Scalable Hematopoietic Cell Sorting: A Deep Learning Approach. ACM-BCB -ASI (Oral)
- Islam, M. M., Akash, R. S., **Azim, S. M**., & He, S. (2025). QPolypNet: A quantum-inspired deep learning model for polyp segmentation. In Proceedings of the IEEE/CVF International Conference on Computer Vision Workshops (ICCVw), CVAMD Workshop. IEEE. (*Poster*)
- **Azim, S. M**, Haque, M. R., and Shatabda, S. (2020). *OriC-ENS: A Sequence-Based Ensemble Classifier for Predicting Origin of Replication in S. cerevisiae*. 19th International Conference On Bioinformatics (InCoB)(*Oral*)
- Leon, M. I., Iqbal, M. I., **Azim, S. M**, Mamun, K. A. *Predicting COVID-19 infections and deaths in Bangladesh using Machine Learning Algorithms*. (2021). International Conference on Information and Communication Technology for Sustainable Development (ICICT4SD) (*Oral*)

Invited Talks and Presentations

- From Pixels to Precision Neuroanatomy: A generative AI-based tool for Automated Segmentation and Identification of Hippocampal Subregions. ***CCIB Summer Research Showcase***, ***2025*** *(**3rd Place** in post-qualifying PhD student category)*
- A Dual U-Net Based Generative Adversarial Network for Murine Hippocampal Region Segmentation. ***CCIB Seminar Series Talk at Rutgers University,2024***
- Explainable machine learning model to accurately predict protein-binding peptides.***CCIB Summer Research Showcase, 2024***
- Automated Harvested Cranberry Sorting: Machine Learning for Distinguishing Sound from Rotten. ***CCIB Seminar Series Talk at Rutgers University,2024***
- DeepAMP: A convolutional neural network-based tool for predicting protein AMPylation sites. ***CCIB Summer Research Showcase, 2023***
- A convolutional neural network-based tool for predicting protein AMPylation sites from binary profile representation. **20th Rocky Mountain Bioinformatics Conference, 8 - 10 Dec 2022**
- Accurately Predicting Anti-Cancer Peptide using an ensemble of heterogeneously Trained Classifiers. **20th Rocky Mountain Bioinformatics Conference, 8 - 10 Dec 2022**
- Deep Learning in Computational Biology, From Problem Formulation to Publication. ***Experts from Industry Series, Daffodil International University, 2022***

SKILLS

- **Deep/Machine Learning Frameworks and libraries:** Tensorflow, Keras, PyTorch, Scikit Learn, OpenCV, Numpy, PIL, Pandas
- **Programming Languages:** Python, R, C/C++, JAVA
- **Cloud Platform:** Amazon AWS, HPC clusters
- **Others:** Huggingface, weight and biases Git, Flask, FastAPI, Docker, MySQL, PHP, Latex

ACADEMIC PROJECTS

- **The Third-Eye** **2020**

  The Third-Eye: A Video Based Helping Aid For Dementia Patients. **(Undergraduate Thesis)**
  - We built a system, The Third-Eye, to automatically identify a person's daily activity from the videos of first-person camera view, and by analyzing the activities provide real-time notification in situations where person forgets to complete a routine task. We used **MobileNetV2** for extracting features from the video data, and **GRU** to recognize activities from the video data. Using a novel **RemAct** model, The third eye notifies the user about missing activities.
- **Hybrid Decision Tree** **2020**

  Designed and implemented a hybrid decision tree algorithm and tested on multiple datasets.
- **Probabilistic undersampling method** **2019**

  Designed and implemented a probabilistic undersampling method and tested on five different datasets.

AWARDS AND FELLOWSHIP

- **NRT Fellow** **2023-present**
  Received National Research Trainee fellowship in Codes for Life (C4L) track funded by NSF
- **CCIB Summer Research Fellowship** **2025**
  Awarded $7750 for conducting independent research on *Automated Murine Tissue Image Analysis*
- **ICCV BP Grant** **2025**
  Received full registration waiver and $600 stipend for attending ICCV 2025
- **Student Travel Award** **2025**
  Received full registration waiver for attending ACM-BCB 2025
- **CCIB Travel Grant** **2025**
  Awarded $1000 for attending ACM-BCB 2025
- **NRT Travel Grant** **2025**
  Awarded $1250 for attending ICCV 2025
- **Champion in "Software" category - UIU CSE project show** **Spring 2019**
- **Champion in "Hardware" category - UIU CSE project show** **Summer 2019**
- **Runner-up in AI Contest - UIU CSE project show** **Fall 2019**
- **Full Scholarship based on trimester result** **2016-2020**
  - **Obtained 100% scholarship in nine consecutive trimesters**

SERVICES

- **Reviewer** **2023-Present**
  - **Computers in Biology and Medicine**
  - **Computational Intelligence**
  - **Frontiers in Neuroscience**
  - **Scientific Reports**
  - **Knowledge and Infromation Systems**
  - **IEEE EMBS BHI 2025**
  - **ICCVw CVMD 2025**
- **Volunteered at ACM-BCB** **2025**
- **Assisted as the referee on Engineering Science and Technology, an International Journal** **2020**
- **Executive Committee Member, ISCB UIU Chapter** **2019**