

# Md Shazid Islam

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## INTRODUCTION

I am a Ph.D. candidate specializing in machine learning, deep learning, and computer vision, with a strong focus on biomedical image analysis. My research develops data-efficient and reliable medical AI through domain adaptation, vision-language models, and active learning, enabling systems that adapt to domain shifts and reduce annotation burdens specially in segmentation task. I also have experience with GANs, GNNs, transformers, multimodal fusion, federated learning, tracking, and human pose estimation.

## EDUCATION

**Ph.D.**, UC Riverside (Sept 2020 – Present )

Electrical & Computer Engineering  
Vision and Learning Group

Advisor: Amit K. Roy-Chowdhury

**M.Sc.**, BUET (Oct 2017 – July 2020 )

Electrical & Electronic Engineering (CGPA: 4.00)  
Advisor: S.M. Mahbubur Rahman

**B.Sc.**, BUET (Feb 2013 – Sept 2017)

Electrical & Electronic Engineering (CGPA: 3.89)  
Advisor: Mohammad Ariful Haque

## RESEARCH INTEREST

- Computer Vision
- Vision-Language Models
- Large Language Models (LLM)
- Deep Learning
- Medical/Bio Imaging
- Multimodal Learning
- Federated Learning

## TECHNICAL SKILLS

- **Languages:** Python, C/C++, MATLAB
- **Libraries:** PyTorch, TensorFlow, OpenCV
- **Models:** CLIP, SAM, BiomedParse, LLaVA
- **Bioimaging Tools:** Cellpose, MorphographX
- **Biomedical data:** MRI, CT, X-Ray, Ultrasound, EEG, EMG, CLSM Microscopy
- **Platforms:** CUDA, Colab, AWS, HPC
- **Data Libraries:** Numpy, Pandas, Sklearn
- **Others:** Docker, Git, LaTeX, SQL

## RESEARCH PROJECTS

- **Online Domain Adaptive Medical Image Segmentation (ODES):** Developed a source-free, single-pass online adaptation framework that integrates expert-guided active learning to overcome noisy pseudo-labels under domain shift. Introduced image pruning and a diversity-aware acquisition strategy to reduce annotations while outperforming test-time adaptation baselines.
- **Active Learning via Vision–Language Models (LINGUAL):** Proposed a language-guided annotation framework that replaces pixel-level corrections with natural-language instructions, translated into executable refinement programs using LLM. Achieved comparable or superior performance to AL baselines while reducing estimated annotation time by ~80%.
- **Bio-Image Analysis:**
  - 3D segmentation, reconstruction, and registration of volumetric plant cell datasets acquired via CLSM (Confocal Laser Scanning Microscopy).
  - Developing a deep learning framework for spatio-temporal plant cell tracking and division detection using Graph Neural Networks (GNNs).
  - 3D segmentation and reconstruction of Drosophila wing disc imagery for morphological and developmental analysis.
- **Report Generation by VLM (ongoing):** An agentic medical (CXR) report generation system that performs stepwise reasoning grounded directly in the visual evidence. By incorporating explicit uncertainty modeling, the framework distinguishes between ambiguous findings and confident impressions while adapting its reasoning strategy accordingly.
- **Gait Phase Analysis:** Novel s-EMG algorithm to classify gait phases in DNS, UPS, and WAK locomotion.
- **Music-to-Dance Synthesis (CNN–LSTM–MDN + GAN):** Developed a multimodal architecture that learns style-specific dance movements from music using a CNN–LSTM–MDN model for rhythmic human pose generation and a Pix2pixHD GAN for photo-realistic dance synthesis, outperforming prior methods across Ballet, Rumba, Cha-Cha, Tango, and Waltz.
- **BRIAR:** Multi-person tracking with occlusion; silhouette segmentation; GAIT and ReID-based recognition.
- **Asynchronous Federated Learning:** Delay-aware framework addressing stragglers; introduces buffer diversification and contribution-based weighting.

## SELECTED PUBLICATIONS

- **Md Shazid Islam**, Sayak Nag, Arindam Dutta, Miraj Ahmed, Fahim Faisal Niloy, Shreyangshu Bera, Amit K. Roy Chowdhury, “*ODES: Online Domain Adaptation with Expert Guidance for Medical Image Segmentation*”, International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI) 2025. [paper](#)
- **Md Shazid Islam**, Arindam Dutta, Calvin-Khang Ta, Kevin Rodriguez, Christian Michael, Mark Alber, G. Venugopala Reddy, Amit K. Roy Chowdhury, “*DEGAST3D : Learning Deformable 3D Graph Similarity to Track Plant Cells in Unregistered Time Lapse Images*”, IEEE Transactions on Computational Biology and Bioinformatics, 2025. [paper](#)
- **Md Shazid Islam**, Shreyangshu Bera, Sudipta Paul, Amit K. Roy Chowdhury, “*LINGUAL: Language-INtegrated GUidence in Active Learning for Medical Image Segmentation.*” (under review) [pre-print](#)
- **Md Shazid Islam**, SM Mahbubur Rahman, “*Synthesis of Dance by Learning Body Gestures from Music*”, Multimedia Tools and Applications, September 2025 [paper](#) [Video](#)
- **Md Shazid Islam**, M Yashwanth, Xiangyu Chang, Anirban Chakraborty, Srikanth Krishnamurthy, Amit Roy-Chowdhury, “*DAAFL: Delay Aware Asynchronous Federated Learning*” (under review)
- Md Sanzid Bin Hossain, **Md Shazid Islam**, Md Saad Ul Haque Md Saydur Rahman “*Gait Phase Classification from sEMG in Multiple Locomotion Mode Using Deep Learning*”, 9th International Congress on Information and Communication Technology, London, UK, 2024. [paper](#)

- **Md Shazid Islam**, ASM Jahid Hasan, Md Saydur Rahman, Jubair Yusuf, Md Saiful Islam Sajal, Farhana Akter Tumpa, “*Location Agnostic Source-Free Domain Adaptive Learning to Predict Solar Power Generation*”, IEEE International Conference on Energy Technologies for Future Grids, Wollongong, Australia, 2023. [paper](#)
- Md Saiful Islam Sajol, ASM Jahid Hasan, **Md Shazid Islam** and Md Saydur Rahman, “*A ConvNeXt V2 Approach to Document Image Analysis: Enhancing High-Accuracy Classification*”, IEEE 3rd Conference on Information Technology and Data Science, Debrecen, Hungary, 2024. [paper](#)
- Md Saiful Islam Sajol, ASM Jahid Hasan, **Md Shazid Islam** and Md Saydur Rahman, “*Transforming Social Media Analysis: TweetEval Benchmarking with Advanced Transformer Models*”, International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT), Ankara, Turkey, 2024. [paper](#)

## HONORS AND AWARDS

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- MICCAI NIH Registration Grant 2025
- Dean's Distinguished Fellowship, University of California, Riverside
- Dean's list Scholarship, Dept. of Electrical and Electronic Engineering, BUET .
- Merit Scholarship, Dept. of Electrical and Electronic Engineering, BUET.

## GRADUATE COURSES

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- Advanced Computer Vision • Pattern Recognition • Design And Analysis Of Algorithms
- Deep Learning • Stochastic Processes • State and Parameter Estimation Theory
- Convex Optimization • Math Methods for Engineering • Information Theory