Taminul Islam

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Summary

PhD Student in Computer Science with expertise in AI/ML, computer vision, and deep learning. Proficient in Python, TensorFlow, and data analysis with strong foundation in statistical modeling and machine learning algorithms. Led cross-functional teams to develop scalable AI solutions for real-world applications, with 25+ publications demonstrating ability to deliver high-impact research and translate academic insights into practical solutions.

Education

Southern Illinois University Carbondale, PhD in Computer Science — Spring 2024 – Present, Carbondale, IL
- Current GPA: 4.0/4.0, Graduate Research Assistant (AI/ML/CV) at BASE Lab

Daffodil International University, BS in Computer Science and Engineering — Spring 2018 – Fall 2021, Dhaka, Bangladesh
- GPA: 3.52/4.0, Full Free Scholarship recipient for extra-curricular excellence

Experience

Graduate Research Assistant, BASE Lab, SIUC – Carbondale, IL — Jan 2024 – Present

- Created CarboNeXT and CarboFormer (lightweight variant, 5.07M params) dual semantic segmentation architectures achieving >88.40% mIoU for CO_2 emission quantification using optical gas imaging (Under Review - **NeurIPS 2025**), and developed GasTwinFormer hybrid vision transformer for livestock methane emission segmentation and dietary classification in OGI (**Accepted: ICCV 2025 Workshop - Oral**)
  Code: [CarboNeXT/CarboFormer] | [GasTwinFormer]
- Developed WeedSwin hierarchical vision transformer achieving >99.3% accuracy in weed detection and growth stage classification, published in **Scientific Reports**, and created WeedSense multi-task learning architecture for weed segmentation, height estimation, and growth stage classification (**Accepted: ICCV 2025 Workshop - Poster**) Code: [WeedSwin]
- Built automated ML/AI pipelines for cannabis seed detection with 94%+ accuracy using RetinaNet and Faster R-CNN on 3,319 high-resolution images, published in **Seeds**.

Recent Key Publications

- **Islam, T.**, Sarker, T. T., Embaby, M. G., Ahmed, K. R., & AbuGhazaleh, A. (2025). CarboNeXT and CarboFormer: Dual Semantic Segmentation Architectures for Detecting and Quantifying Carbon Dioxide Emissions Using Optical Gas Imaging. *arXiv preprint arXiv:2506.05360*. - (Under Review - **NeurIPS 2025**)
- **Islam, T.**, Sarker, T. T., Ahmed, K. R., Rankrape, C. B., & Gage, K. (2025). WeedSwin hierarchical vision transformer with SAM-2 for multi-stage weed detection and classification. **Scientific Reports**, *15*(1), 23274.
- **Islam, T.**, Sheakh, M. A., Tahosin, M. S., Hena, M. H., Akash, S., Bin Jardan, Y. A., ... & Bourhia, M. (2024). Predictive modeling for breast cancer classification in the context of Bangladeshi patients by use of machine learning approach with explainable AI. **Scientific Reports**, *14*(1), 8487.
- **Islam, T.**, Sarker, T. T., Ahmed, K. R., & Lakhssassi, N. (2024). Detection and Classification of Cannabis Seeds Using RetinaNet and Faster R-CNN. **Seeds**, MDPI.

Technical Skills

Programming Languages: Python, JavaScript, HTML/CSS

AI Frameworks: TensorFlow, PyTorch, Keras, Scikit-learn, OpenCV, YOLO, Transformer Models, SAM-2

Computer Vision: Semantic Segmentation, Object Detection, Image Classification, Optical Gas Imaging, Medical Imaging

Tools & Platforms: Cursor, Git/GitHub, Google Cloud Platform, VS Code, LATEX

Awards & Leadership

Research & Academic: Associate Editor (Frontiers in Medicine Q1), 13 peer reviews, ACM Professional Member

Leadership: General Secretary, Bangladesh Student Association (Best RSO Award 2025), Captain - Cricket & Badminton Champions SIUC 2024-2025