Toqi Tahamid Sarker

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Education

Southern Illinois University — Carbondale, USA
Ph.D. Computer Science, Current GPA: 4.0/4.0 — *Aug. 2023 - Present*

BRAC University — Dhaka, Bangladesh
B.S. Computer Science; GPA: 3.31/4.00 — *Sep. 2012 – Dec. 2016*

Research Experience

Graduate Research Assistant — Aug. 2023 – Present
BASE Lab, Southern Illinois University — *Carbondale, USA*

Methane Gas Segmentation | *PyTorch, MMSegmentation, scikit-image* — Aug. 2023 – Mar. 2024

- Accurate methane gas segmentation is crucial for environmental monitoring and climate change mitigation
- My objective was to create a novel deep learning model to segment low-flow rate methane gas accurately
- Created a semantic segmentation architecture to segment methane gas on two new datasets created with a FLIR GF77 camera
- Gasformer outperformed other state-of-the-art models on both methane gas datasets, enabling more accurate methane gas segmentation

Graduate Research Assistant — Aug. 2018 – Aug. 2019
Panacea Lab, Georgia State University — *Atlanta, USA*

Solar Event Tracking | *Caffe, SunPy* — Mar. 2019 – Aug. 2019

- Needed accurate location of solar events for space weather forecasting
- My goal was to create a deep learning model to track solar event locations in future images
- Created a large-scale solar dataset with over 500,000 images collected from NASA solar dynamics observatory and trained a deep regression network to track solar event locations in future images
- Enhanced model validation with multiple evaluation metrics, enabling more accurate solar event forecasting

Research Publications

Conference Proceedings

[1] T. T. Sarker, M. G. Embaby, K. R. Ahmed, A. Abughazaleh. **Gasformer: A Transformer-based Architecture for Segmenting Methane Emissions from Livestock in Optical Gas Imaging**. In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*. June 2024, pp. 5489–5497.

[2] T. T. Sarker, J. M. Banda. **Solar Event Tracking with Deep Regression Networks: A Proof of Concept Evaluation**. In: *2019 IEEE International Conference on Big Data (Big Data)*. IEEE. 2019, pp. 4942–4949.

Technical Skills

Deep Learning Frameworks: PyTorch, MMSegmentation, MMDetection
Computer Vision Techniques: Semantic Segmentation, Image Classification, Object Detection
Languages: Python, JavaScript, Java, C++, LaTeX
Databases: PostgreSQL

Mentorship

Graduate Teaching Assistant | *CSC 1010 - Computers and Applications* — Summer, 2019
Graduate Teaching Assistant | *CSC 4980/6980 - Blockchain and Applications* — Spring, 2019

Reviewer

IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops — Mar. 2024 – Apr. 2024