Mohammad Samiul Arshad

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Experience

AI Research Scientist Intern, Hanwha Vision — Aug. 2023 - Nov 2023
- Developed AI solutions for the **detection and segmentation** to meet business needs
- Optimized segmentation models to run in **real-time on edge devices**

Research Assistant, Robotic Vision Lab, UTA — Aug. 2018 - Aug. 2023
- Researched and developed novel techniques for **3D reconstruction and generation**
- Developed the *first* deep learning solution for colored point cloud generation

Research Assistant, ASSIST Lab, UTA — Aug. 2016 - Aug. 2018
- Analyzed and developed movement **tracking algorithm on a pressure-sensitive floor** for assisted living

Senior Software Engineer, TwinBit — Jan. 2014 - Aug. 2016
- Designed and developed software applications following requirements, and deployed to the cloud
- **Managed a team of developers in building software applications**

Education

Ph.D. in **Deep Learning, Computer Vision** — Aug. 2016 - Aug. 2023
The University of Texas at Arlington — Arlington, Texas

Skills

- **AI/ML**: Detection, Segmentation, 3D Reconstruction, Generative Models, LLMs, DNN Quantization, Optimization, Diffusion Models, NeRF, SAM, Recommendation, Regression Analysis
- **Programming**: Python, C++, C, Objective C, Matlab, Java, Bash
- **Library/Framework**: PyTorch, Tensorflow, JAX, OpenCV, Open3D, ONNX, OpenAI, TensorRT
- **Tools/Services**: Git, Pandas, MySQL, Docker, mlFlow, Kubernetes, Azure ML, AWS, Slurm, LiDAR, CI/CD, GNU/Linux, LaTeX

Projects

Single View Reconstruction
- Devised a novel neural learning framework that accurately reconstructs 3D object from a single RGB image [1]
- Proposed method shows significant improvement **(≈3%)** over current baselines in occluded surface recovery

Open Surface Reconstruction
- Designed neural architecture and inference algorithm to reconstruct 3D open surfaces
- The reconstructed data contains significantly less noise than existing methods [2], [3]

PCGAN
- Devised the **first** neural architecture to generate dense, colored 3D point clouds [4]

Sign Language Detection and Recognition
- Designed a novel algorithm that automatically identifies Bengali sign language from single 2D image [5]
- The proposed algorithm achieved ≈ **8% improvement** on identification accuracy over the state of the art

Selected Publications

[1] **M. S. Arshad** and W. J. Beksi, "LIST: Learning Implicitly from Spatial Transformers for Single-View 3D Reconstruction," in *Proceedings of the **IEEE/CVF International Conference on Computer Vision (ICCV)***, 2023, pp. 9321–9330.

[2] **M. S. Arshad** and W. J. Beksi, "IPVNet: Learning Implicit Point-Voxel Features for Open-Surface 3D Reconstruction," ***Journal of Visual Communication and Image Representation***, vol. 97, p. 103 970, 2023, ISSN: 1047-3203. DOI: https://doi.org/10.1016/j.jvcir.2023.103970.

[3] **M. S. Arshad** and W. J. Beksi, "Automated reconstruction of 3d open surfaces from sparse point clouds," in *Proceedings of the **IEEE International Symposium on Mixed and Augmented Reality (ISMAR)** Workshops*, 2022, pp. 216–221.

[4] **M. S. Arshad** and W. J. Beksi, "A progressive conditional generative adversarial network for generating dense and colored 3d point clouds," in *Proceedings of the **International Conference on 3D Vision (3DV)***, IEEE, 2020, pp. 712–722.

[5] A. M. Jarman, **M. S. Arshad**, N. Alam, and M. J. Islam, "An automated bengali sign language recognition system based on fingertip finder algorithm," ***International journal of electronics and informatics***, vol. 4, no. 1, pp. 1–10, 2015.