

Mohammad Samiul Arshad

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EXPERIENCE

- AI Research Scientist Intern**, Hanwha Vision Aug. 2023 - Nov 2023
- Developed AI solutions for **anomaly 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, C#, MATLAB, Java, JavaScript, Bash
- **Library/Framework**: PyTorch, Tensorflow, JAX, OpenCV, Open3D, ONNX, OpenAI, TensorRT, scikit-learn, Keras
- **Tools/Services**: Git, Pandas, MySQL, Docker, mlFlow, Kubernetes, Azure ML, AWS, Slurm, LiDAR, CI/CD, GNU/Linux, \LaTeX

PROJECTS

- Single View Reconstruction** || *Python, PyTorch, OpenCV, Open3D, mlFlow*
- Devised a novel neural learning framework that accurately reconstructs 3D object from a single RGB image [1]
 - Proposed method shows significant improvement ($\approx 3\%$) over current baselines in occluded surface recovery
- Open Surface Reconstruction** || *Python, PyTorch, Open3D, mlFlow*
- Designed neural architecture and inference algorithm to reconstruct 3D open surfaces
 - The reconstructed data contains significantly less noise than existing methods [2], [3]
- PCGAN** || *Python, PyTorch, Open3D*
- Devised the **first** neural architecture to generate dense, colored 3D point clouds [4]
- Sign Language Detection and Recognition** || *MATLAB, MATLAB DL Toolbox*
- Designed a novel algorithm that automatically identifies Bengali sign language from single 2D image [5]
 - The proposed algorithm achieved $\approx 8\%$ **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.