Mohammad Samiul Arshad

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Education

Ph.D. in Computer Science & Engineering Aug. 2016 - Aug. 2023 (Expected)

The University of Texas at Arlington Arlington, Texas

- **Committee**: Dr. Manfred Huber, Dr. Gautam Das, Dr. Vassilis Athitsos, Dr. William J. Beksi (*advisor*)
- **Dissertation**: Learning from Raw Point Cloud Data for 3D Computer Vision Tasks
- **Courses**: Distributed Systems, Design and Analysis of Algorithms, Data Analysis and Modeling Techniques, Robotics, Computer Architecture, Neural Networks, Machine Learning, Computer Vision, Advanced Computational Models And Algorithms, Special Topics in Advanced Intelligent Systems

B.S. in Computer Science Aug. 2009 - Dec. 2014

Shahjalal University of Science and Technology Sylhet, Bangladesh

- **Advisor**: Dr. M. Jahirul Islam
- **Thesis**: Bengali Sign Language Detection and Recognition [5]
- **Courses**: Data Structure and Algorithm, Introduction to Database, Object Oriented Programming, Image Processing, Operating System, Digital Signal Processing, Algorithms and Data Structures

Experience

Teaching Assistant Aug. 2016 - Present

The University of Texas at Arlington Arlington, Texas

- **Courses**: Distributed Systems (Fall 19 - Spring 23), Object Oriented Programming (Summer 19), Artificial Intelligence (Summer, 19), Design and Analysis of Algorithms (Spring 19), Algorithms and Data Structures (Fall 18), Mobile Systems Engineering (Summer 18), Introduction to Computers and Programming (Fall 17 - Spring 18), Intermediate Programming (Fall 16 - Summer 17)
- Assisted the course instructor in preparing lesson plans and educational materials for the class
- Conducted office hours; Helped students with their academic work and answered any questions they had about the course material
- Graded assignments and tests, organized lab demonstrations, and provided feedback to students on their performance.
- Conducted class lectures in the absence of the primary instructor

Graduate Researcher Aug. 2018 - Present

Robotic Vision Laboratory Arlington, Texas

- Research on reconstruction and generation of 3D data through Deep Learning and Computer Vision algorithms
- Designing novel neural architecture for solving open problems in Computer Vision

Graduate Researcher Aug. 2016 - Aug. 2018

LEARN Lab Arlington, Texas

- Research on movement analysis through a pressure-sensitive floor for assisted living

Software Engineer Jan. 2015 - Jan. 2016

TwinBit Dhaka, Bangladesh

- Research and development of mobile applications through MVC architecture
- Designed and deployed multiple mobile applications in App Store

Awards

- Cyneta Networks Outstanding Graduate TA Award 2022, The University of Texas at Arlington

Projects

3D Printed Model from Sparse Data

· Developing novel techniques to reconstruct and 3D print an object from sparse point clouds

Single View Reconstruction

· Devised a novel neural learning framework that reconstructs 3D object with accurate topological structure and self-occluded geometry from a single 2D image [1]

Open Surface Reconstruction

· Designed an implicit learning architecture and inference algorithm that reconstructs 3D open surfaces while preserving surface details such as holes and gaps

· The reconstructed data contains significantly less noise than existing methods [3] [2]

3D GAN

· Investigated unsupervised 3D point cloud generation, and devised the first neural architecture to generate dense, colored 3D point clouds [4]

Bengali Sign Language Detection and Recognition

· 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

Publications

[1] **M. S. Arshad** and W. J. Beksi, "ImUP3D: Learning implicit function from un-aligned pixel features for single view 3d reconstruction," in *Revision*, 2023.

[2] **M. S. Arshad** and W. J. Beksi, "IPVNet: Learning implicit point-voxel features for open-surface 3d reconstruction," in *Revision*, 2023.

[3] **M. S. Arshad** and W. J. Beksi, "Automated reconstruction of 3d open surfaces from sparse point clouds," in *2022 International Symposium on Mixed and Augmented Reality*, 2022.

[4] **M. S. Arshad** and W. J. Beksi, "A progressive conditional generative adversarial network for generating dense and colored 3d point clouds," in *2020 International Conference on 3D Vision (3DV)*, 2020, pp. 712–722. DOI: 10.1109/3DV50981.2020.00081.

[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 & informatics*, vol. 4, no. 1, pp. 1–10, 2015.

Poster Presentation (Refereed)

Note: The presenter is underlined.

[P1] **M. S. Arshad** and W.J. Beksi. Synthesizing Dense and Colored 3D Point Clouds for Training Deep Neural Networks, *TACC Symposium for Texas Researchers (TACCSTER)*, Austin, USA, 2020.

[P2] **M. S. Arshad** and W.J. Beksi. 3D Scene Generation via Unsupervised Object Synthesis, *TACC Symposium for Texas Researchers (TACCSTER)*, Austin, USA, 2019.

Media

[M1] How to Train a Robot (Using AI and Supercomputers), Science Stories: Texas Advanced Computing Center, *Jan. 19, 2021*

Services

Reviewer

· IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

· IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

· International Conference on Ubiquitous Robots (UR)

· IEEE/SICE International Symposium on System Integration (SII)

· International Conference on 3D Vision (3DV)

Outreach

· Engineers Week: Volunteer — Feb. 2022
Jerry Knight STEM Academy (MISD) — Mansfiled, TX

· College of Engineering Innovation Day: Volunteer Judge — Mar. 2022
The University of Texas at Arlington — Arlington, TX

· Programming Contest: Volunteer and Team Mentor — 2010 - 2011
Shahjalal University of Science and Technology — Sylhet, Bangladesh

Skills

· **Programming**: Python, Matlab, C, C++, Objective C, Java, Bash

· **Libraries/Frameworks**: PyTorch, PyTorch3D, Tensorflow, Keras, OpenCV, Open3D, scikit-learn

· **Tools**: GNU/Linux, LaTeX, Git, Jupyter Notebooks, Slurm

Reference

· Dr. William Beksi - Assistant Professor of Computer Science & Engineering, UTA
Email: william.beksi@uta.edu

· Dr. M. Jahirul Islam - Professor of Computer Science & Engineering, SUST
Email: jahir-cse@sust.edu