Varun Shijo

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Education

2022 – · · · · **Ph.D. Computer Science and Engineering, University at Buffalo** Deep Learning for Biomedical Applications

2017 – 2019 **M.Sc. Computer Science and Engineering, University at Buffalo** in Artificial Intelligence.

2013 – 2017 **B.Engg. Information Technology, University of Mumbai**

Research Interests

Deep Learning
Biomedical Imaging
Computer Vision
Cyber-Physical Systems
Brain-Computer Interfaces

Research Publications

Journal Articles

1. W. Zheng, H. Zhang, C. Huang, **V. Shijo**, C. Xu, W. Xu, and J. Xia, "Deep Learning Enhanced Volumetric Photoacoustic Imaging of Vasculature in Human," en, *Advanced Science*, vol. 10, no. 29, p. 2 301 277, 2023, _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1002/advs.202301277, ISSN: 2198-3844. DOI: 10.1002/advs.202301277.

Conference Proceedings

1. R. W. Bing, **V. Shijo**, E. Zheng, W. Zheng, C. Huang, and J. Xia, "Wearable Photoacoustic/Ultrasound Imaging with a Curved Linear Array," in *2023 IEEE International Ultrasonics Symposium (IUS)*, ISSN: 1948-5727, Sep. 2023, pp. 1–5. DOI: 10.1109/IUS51837.2023.10307045.
2. **V. Shijo**, T. Vu, J. Yao, W. Xu, and J. Xia, "SwinIR for Photoacoustic Computed Tomography Artifact Reduction," in *2023 IEEE International Ultrasonics Symposium (IUS)*, ISSN: 1948-5727, Sep. 2023, pp. 1–4. DOI: 10.1109/IUS51837.2023.10307937.

Ongoing Projects

2024 – · · · · Wireless Self-directed 3D Freehand Breast Ultrasound

3D Structure-Aware PACT Breast Tumor Classification - OneTouch PAT System

2023 – · · · · 2D Dual Modal Breast Tumor Classification - OneTouch PAT System (Planned for RSNA Radiology)

Teaching Experience

2024 CSE573: Intro. to Computer Vision and Image Processing (Graduate Student Instructor)

CSE560: Data Models and Query Languages, Dr. Sreyasee Das Bhattacharjee (Teaching Assistant)

2023 CSE666: Biometrics Image Analysis, Dr. Nalini Ratha (Teaching Assistant)

Industry Experience

2021 – 2022 **Software Engineer, Innovations Lab** *TATA AIG, Mumbai, India*
Scene Text Recognition - Trained Custom Recognition Model Pipeline
Added support for model training and inference in PyTorch, and replaced existing classifier with MobileNetv3 classifier resulting in 5.4x speedup with ~1% accuracy drop

2019 – 2020 **Software Developer II, LABS** *CentralSquare Technologies, Greensboro, NC, USA*
XGBoost Model improvements - Added focal loss for imbalanced dataset
Built synthetic data generator in golang capable of streaming millions of GPS coordinates in realtime

Mentoring Experience

2024 - · · · · Nihar Asare (Masters Student, Robotics Engineering @ UB, project: Wireless Self-directed 3D Freehand Breast Ultrasound*)

2023 - 2024 Arianna Dougherty (Masters Student, Biomedical Engineering @ UB, project: OneTouch PAT system for Breast Imaging)

2023 Michelle Lin (High School Student, Williamsville North High School, project: Camera-based PPG for pulsatile signal estimation)

Emma Zhang (High School Student, Williamsville North High School, project: SWIR for moisture quantification)

Emma Durham (Senior Undergraduate BE@UB, project: Robotic Arm-based position tracking for Self-Directed Ultrasound Scanning)

Hannah Pham (Senior Undergraduate BE@UB, project: Face Spoofing Detection using SWIR Imaging)

Skills

Coding Python, MATLAB, Go…

Frameworks PyTorch, Keras, OpenCV, NumPy, Pandas, k-Wave…

Misc Git, wandb, Linux, Docker, Raspberry Pi…

Peer Review

2024 IEEE Body Sensor Networks - Reviewer

Elsevier Smart Health - Reviewer

2023 IEEE Body Sensor Networks - TPC Member

Journal of Innovative Optical Health Sciences - Reviewer

Certifications

2020 **Computer Vision Nanodegree**. Awarded by Udacity.