Yi-Ting (Dennis) Shen

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Summary

Ph.D. candidate specializing in computer vision, deep learning, synthetic data, and multimodal AI. Lead author of publications in top-tier venues (CVPR, ICCV, ICIP) with a proven track record in designing benchmark datasets and innovative frameworks for real-world applications, including aerial-view human detection, human pose retrieval, and medical imaging. Proficient in Python (PyTorch) and C/C++, and recognized with a CVPR Highlight Paper (2.5% of submissions).

Education

Ph.D. in Electrical and Computer Engineering, University of Maryland, College Park 08/2020 – 05/2026 (expected)
M.S. in Electronics Engineering, National Taiwan University 01/2019
B.S. in Electrical Engineering, National Taiwan University 06/2016

Technical Skills

Programming: Python, PyTorch, TensorFlow, OpenCV, C/C++, Verilog, LaTex

Others: Computer Vision, Deep Learning, Synthetic Data Generation and Utilization, Aerial-view Human Detection, UAV Vision, Composed Image and Pose Retrieval, Multimodal Large Language Models, Diffusion Models, Vision Language Models

Professional Experience

Graduate Research Assistant

DSPCAD Research Group, University of Maryland (PI: Prof. Shuvra S. Bhattacharyya)

08/2020 – Present | College Park, MD, USA

- Proposed AutoComPose, the first multimodal large language model framework for automatic pose transition annotation, incorporating a cyclic consistency training scheme and establishing new Composed Pose Retrieval (CPR) benchmarks with state-of-the-art retrieval performance (***ICCV'25***).
- Introduced Progressive Transformation Learning (PTL), a framework that progressively selects and transforms synthetic images using domain gap metrics, improving realism and enhancing UAV-based human detection (***CVPR'23****, Highlight*).
- Formulated SynPoseDiv, a synthetic pose diversification framework that integrates a diffusion-based pose generator with a pose-guided image translation model, enhancing pose diversity and detection performance in aerial-view human datasets (***ICIP'25***).
- Curated and released Archangel (*IEEE Access'23*) and SynPlay (***WACV'26***), large-scale real and synthetic datasets for aerial-view human detection and analysis, featuring rich metadata, multi-perspective coverage, and diverse motions.
- Developed a hyperspectral image classification model optimized for low-resource platforms (*WHISPERS'21*).
- Built a CNN-Transformer hybrid model for fall risk assessment using on-body camera data (***ICASSP'24***, *TNSRE'25*).
- Devised a robust EMA–OCTA retinal image registration framework resilient to vessel density variation (*BOEx'24*).

Graduate Research Assistant

DSPIC Lab, National Taiwan University (PI: Prof. Liang-Gee Chen)

09/2016 – 01/2019 | Taipei, Taiwan

- Established a self-supervised fisheye depth estimation framework for traversability prediction (master's thesis).
- Made a multi-object tracking algorithm using 360° panoramic video inputs (*ICCE'18*).
- Contributed to a weakly supervised indoor scene parsing method based on depth domain adaptation (***ICCV'19***).

R&D Intern

MediaTek (Advisors: Dr. Yu-Wen Huang and Dr. Tzu-Der Chuang)

05/2016 – 08/2016 | Hsinchu, Taiwan

- Accelerated decoder-side PMVD (pattern-based motion vector derivation) and optimized bandwidth efficiency.
- Contribution included in U.S. Patent Application ***US20180249154A1*** (co-inventor).

Undergraduate Research Assistant

DSPIC Lab, National Taiwan University (PI: Prof. Liang-Gee Chen)

09/2014 – 06/2016 | Taipei, Taiwan

- Explored depth cue generation techniques for autostereoscopic 3DTV systems (*ICCE'16*).

Publications

Conference Proceeding

1. Yim, J., Lee, H., Eum, S., **Shen, Y. T.**, Zhang, Y., Kwon, H., & Bhattacharyya, S. S., "SynPlay: Large-Scale Synthetic Human Data with Real-World Diversity for Aerial-View Perception," *The IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**), 2026.*
2. **Shen, Y. T.***, Eum, S.*, Lee, D., Shete, R., Wang, C. Y., Kwon, H., & Bhattacharyya, S. S., "AutoComPose: Automatic Generation of Pose Transition Descriptions for Composed Pose Retrieval Using Multimodal LLMs," *The IEEE/CVF International Conference on Computer Vision (**ICCV**), 2025.* (*equal contribution)
3. **Shen, Y. T.***, Lee, H.*, Kwon, H., & Bhattacharyya, S. S., "Diversifying Human Pose in Synthetic Data for Aerial-view Human Detection," *The IEEE International Conference on Image Processing (**ICIP**), 2025.* (*equal contribution)
4. Wang, C. Y., Sadrieh, F. K., **Shen, Y. T.**, Oppizzi, G., Zhang, L. Q., & Tao, Y., "Real-Time Privacy-Preserving Fall Risk Assessment with a Single Body-Worn Tracking Camera," *The IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP**), 2024.*
5. **Shen, Y. T.***, Lee, H.*, Kwon, H., & Bhattacharyya, S. S., "Progressive Transformation Learning for Leveraging Virtual Images in Training," *The IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023.* (*equal contribution) **[Highlight]**
6. Lee, E. J., **Shen, Y. T.**, Pan, L., Li, Z., & Bhattacharyya, S. S., "DCT-based Hyperspectral Image Classification on Resource-Constrained Platforms," *11th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS), 2021.*
7. Liu, K. C., **Shen, Y. T.**, Klopp, J. P., & Chen, L. G., "What Synthesis is Missing: Depth Adaptation Integrated with Weak Supervision for Indoor Scene Parsing," *The IEEE/CVF International Conference on Computer Vision (**ICCV**), 2019.*
8. Liu, K. C.*, **Shen, Y. T.***, & Chen, L. G., "Simple Online and Realtime Tracking with Spherical Panoramic Camera," *The IEEE International Conference on Consumer Electronics (ICCE), 2018.* (*equal contribution)
9. **Shen, Y. T.**, Liu, G. L., Wu, S. S., & Chen, L. G., "3D Perception Enhancement in Autostereoscopic TV by Depth cue for 3D Model Interaction," *The IEEE International Conference on Consumer Electronics (ICCE), 2016.*

JOURNAL

10. Wang, C. Y., Sadrieh, F. K., **Shen, Y. T.**, Oppizzi, G., Zhang, L. Q., & Tao, Y., "EgoFall: Real-time Privacy-Preserving Fall Risk Assessment with a Single On-Body Tracking Camera," *IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE), 2025.*
11. Wang, C. Y., Sadrieh, F. K., **Shen, Y. T.**, Chen, S. E., Kim, S., Chen, V., ... & Tao, Y., "MEMO: dataset and methods for robust multimodal retinal image registration with large or small vessel density differences," *Biomedical Optics Express (BOEx), 2024.*
12. **Shen, Y. T.**, Lee, Y., Kwon, H., Conover, D. M., Bhattacharyya, S. S., Vale, N., ... & Skirlo, F., "Archangel: A Hybrid UAV-based Human Detection Benchmark with Position and Pose Metadata," *IEEE Access, 2023.*

Awards and Honors

- Highlight Paper, CVPR 2023 (10% of accepted papers, 2.5% of submissions) 06/2023
- Award for Design Complete, Cell-Based Digital Circuit Category, 2018 IC Design Contest 09/2018
- Award for Excellent, Problem E, International CAD Contest at ICCAD 12/2015

Academic Service and Mentorship Experience

- Reviewer: *CVPR 2024-2025*, *ICCV 2025*, *ICLR 2025*, *NeurIPS 2025*, *ICRA 2025*, *WACV 2025*, *TPAMI*, *IEEE Access*, *JSTSP*
- Mentored M.S. students (Doheon Lee, Jinsub Yim) and undergraduate students (Rohit Shete, Joshua Steiner, Eric Huang) at the University of Maryland