

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, 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