Yi-Ting (Dennis) Shen

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Summary

Ph.D. in Electrical and Computer Engineering from the University of Maryland, College Park (May 2026). Specializing in synthetic data generation, multimodal generative models, and learning under domain shift. 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, human-centric applications, including aerial perception and vision-language pose retrieval. Proficient in Python (PyTorch), 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

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, Generative Models, Diffusion Models, GANs, Multimodal Large Language Models (LLMs), Vision-Language Models (VLMs), Multimodal Learning, 3D Engines, Human-Centric Vision, UAV

Professional Experience

Graduate Research Assistant

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

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

- Developed *AutoComPose*, a multimodal LLM-based framework for automatic pose-transition annotation, introducing a cyclic-consistency training paradigm for VLMs and a new Composed Pose Retrieval (CPR) benchmark, achieving state-of-the-art retrieval performance (**ICCV'25**).
- Proposed *Progressive Transformation Learning (PTL)*, a GAN-based framework that adaptively selects and refines synthetic images via domain-gap metrics, improving realism and performance in vision systems under domain shift (**CVPR'23**, Highlight).
- Designed *SynPoseDiv*, a diffusion-based synthetic pose diversification framework integrating generative pose modeling with pose-guided image translation, enhancing distributional diversity and downstream performance (**ICIP'25**).
- Curated and released *Archangel* (IEEE Access'23) and *SynPlay* (**WACV'26**), large-scale real and synthetic datasets for aerial-view human analysis.
- Built a CNN-Transformer model for fall risk assessment using egocentric (on-body) video data (**ICASSP'24**, TNSRE'25).
- Developed 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

- Developed a self-supervised fisheye depth estimation framework for traversability prediction (master's thesis).
- Designed a multi-object tracking algorithm for 360° panoramic video (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 pattern-based motion vector derivation (PMVD) and optimized bandwidth efficiency.
- Co-inventor of U.S. Patent Application US20180249154A1.

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