Yi-Ting (Dennis) Shen

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Summary

Ph.D. in Electrical and Computer Engineering from the University of Maryland, College Park. Specializing in synthetic data generation, generative models, multimodal learning, 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 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, Scikit-learn, C/C++, Verilog, LaTeX
Areas: Computer Vision, Deep Learning, Human-Centric Vision, UAV Vision, Object Detection
Generative AI & Data: Generative Models, Diffusion Models, GANs, Synthetic Data, 3D Engines, Data-Centric AI
Multimodal Learning: Multimodal LLMs, VLMs, Foundation Models, Transformers, Pose Understanding & Reasoning

Professional Experience

Graduate Research Assistant

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

08/2020 – 05/2026 | College Park, MD, USA

- Developed *AutoComPose*, a framework for automatic pose-transition annotation using multimodal LLMs. Introduced a cyclic-consistency training paradigm for VLMs (CLIP) and a new Composed Pose Retrieval (CPR) benchmark, achieving state-of-the-art retrieval performance (**ICCV'25, first author**).
- Proposed *Progressive Transformation Learning (PTL)*, a GAN-based framework that adaptively selects and refines synthetic images using domain-gap metrics, improving realism and downstream vision performance under domain shift (**CVPR'23 Highlight, first author**).
- Designed *SynPoseDiv*, a diffusion-based synthetic pose diversification framework integrating generative pose modeling with pose-guided image translation, enhancing distributional diversity and detection performance (**ICIP'25, first author**).
- Built and released multiple datasets (*Archangel*, *SynPlay*, *CPR*) using 3D engines for aerial human analysis and multimodal pose learning, enabling research in data-efficient and simulation-driven learning (**IEEE Access'23, first author**; **WACV'26**)
- Proposed *DDHC*, a DCT-based hyperspectral classification framework, enabling efficient accuracy-compute trade-offs and deployment on resource-constrained platforms (WHISPERS'21).
- Developed *EgoFall*, a real-time privacy-preserving egocentric fall risk assessment system using a chest-mounted camera and a lightweight CNN-Transformer architecture (**ICASSP'24**, TNSRE'25).
- Proposed *MEMO*, a multimodal EMA-OCTA retinal dataset, and *VDD-Reg*, a segmentation-based framework with semi-supervised learning for multimodal retinal image registration robust 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 learning framework for fisheye depth estimation, enabling geometry-aware traversability prediction generalizable across environments (master's thesis).
- Contributed to weakly supervised scene parsing through depth-based domain adaptation using synthetic data (**ICCV'19**).
- Designed a multi-object tracking algorithm for 360° panoramic video (ICCE'18).

R&D Intern

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

05/2016 – 08/2016 | Hsinchu, Taiwan

- Accelerated decoder-side pattern-based motion vector derivation (PMVD) using SIMD-based parallel computing and improved bandwidth efficiency in video codec pipelines. Co-inventor on U.S. Patent Application US20180249154A1.

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 2024-2026*, *ICCV 2025*, *ECCV 2026*, *ICLR 2025*, *NeurIPS 2025*, *ICRA 2025*, *WACV 2025*, *TPAMI*
- Mentored M.S. students (Doheon Lee, Jinsub Yim) and undergraduate students (Rohit Shete, Joshua Steiner, Eric Huang) at the University of Maryland

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.*
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.*
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.*
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. **Shen, Y. T.**, Liu, K. C., & Chen, L. G., "Simple Online and Realtime Tracking with Spherical Panoramic Camera," *The IEEE International Conference on Consumer Electronics (ICCE), 2018.*

Journal

9. 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.*
10. 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.*
11. **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.*