Tsung-Shan (Kevin) Yang

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Education

University of Southern California (USC) Aug 2022 – Dec 2025(expected)
Ph.D. candidate in Electrical and Computer Engineering

- **Advisor**: Prof. **C-C. Jay Kuo**
- **Thesis:** Interpretable and Efficient Multi-Modal Data Interplay: Algorithms and Applications

National Taiwan University (NTU) B.S., M.S. in Electrical Engineering Sep 2014 – Jun 2021
National Taiwan University (NTU) B.S. in Chemistry Sep 2014 – Jun 2019

Experience

Machine Learning Engineer, Tiktok Inc. – San Jose, CA May 2025 – Present

- Developed an efficient AI-generated video detection model using lightweight architectures
- Achieved state-of-the-art performance with 3% of model parameters and a 98% reduction in inference time
- Accelerated hack-detection pipeline 10× by identifying malicious users and abnormal video patterns

Selected Publications

[C1] SVD-Det: A Lightweight Framework for Video Forgery Detection Using Semantic and Visual Defect Cues

Tsung-Shan Yang, Tianyu Zhang, Feng Qian, Bing Yan, C.-C. Jay Kuo
*Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**)(2026)*

- 97% smaller, 98% faster, while achieving +2.7% higher AUC for AIGC video forgery detection

[J1] Efficient Human-Object-Interaction Detection via Interaction Label Coding and Conditional Decision

Tsung-Shan Yang, Yun-Cheng Wang, Chengwei Wei, Suya You, C.-C. Jay Kuo
*Computer Vision and Image Understanding (**CVIU**)(2025): 104390.*

- Reduce computational cost by 15,800× fewer FLOPs compared to state-of-the-art methods

[C2] Challenges in video-text retrieval: via transparent alignment

Tsung-Shan Yang, Yun-Cheng Wang, Chengwei Wei, Suya You, C.-C. Jay Kuo
Applications of Digital Image Processing XLVIII. Vol. 13605. SPIE, 2025

- Deploy an explainable ranking pipeline for video-text retrieval, reducing 97% trainable parameters

[J2] Image-Text Retrieval via Green Explainable Multi-modal Alignment (GEMMA)

Tsung-Shan Yang, Yun-Cheng Wang, Chengwei Wei, Suya You, C.-C. Jay Kuo
APSIPA Transactions on Signal and Information Processing(2025)

- Developed an interpretable alignment framework for image and text encoders with 3% of trainable parameters

[C3] BPQA: A Blind Point Cloud Quality Assessment Method

Qingyang Zhou, Aolin Feng, **Tsung-Shan Yang**, Shan Liu, C.-C. Jay Kuo
*IEEE International Conference on Image Processing Challenges and Workshops (**ICIPCW**), 2023*

- Develop an interpretable learning framework with minimal computational overhead

[J3] Viewing Bias Matters in 360 Videos Visual Saliency Prediction

Peng-Wen Chen, **Tsung-Shan Yang**, Gi-Luen Huang, Chia-Wen Huang, Yu-Chieh Chao, Pei-Yuan Wu
IEEE Access Journal paper, 2023

- Analyzed human bias in saliency maps and extended spherical kernels to time-series data

[C4] NTIRE 2020 Challenge on NonHomogeneous Dehazing

*Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops. (**CVPRW**) 2020.*

- Propose an attention refinement block of the deep learning model

Awards/Scholarships

2024 IEEE MIPR Student Grant — *IEEE TCMC*
2022 Taiwan - USC Scholarship — *Ministry of Education in Taiwan*
2022 Viterbi School of Engineering / Graduate School Fellowship — *Univserity of Southern California*
2014 Fall & 2015 Spring Dean's List — *National Taiwan University*
2011 Gold Medal — *International Junior Science Olympiad*

Teaching Experience

Systems for Machine Learning, University of Southern California — 2024 Spring, 2025 Spring
- Introduce the hardware of TPUs and GPUs
- Design the project about LLM inference, such as LoRA and KV-cache

Introduction for Programming, University of Southern California — 2024 Fall
- Lead weekly hand-on labs
- Introduce good coding styles and algorithms

Machine Learning, National Taiwan University — 2019 Fall, 2020 Fall
- Design assignments about theoretical analysis and deep learning projects
- Maintain the course website

Data Structure, National Taiwan University — 2020 Spring
- Design assignments about theoretical analysis and data structure implementation

General Chemistry, National Taiwan University — 2018 Fall
- Lead group discussions and provide hints on assignments
- Provide two-hour TA classes each week for over 300 students

Technologies

Languages: Python, C++, C, HTML, MATLAB

Strength: Computer Vision, Deep Learning, Algorithm Design, Physical Chemistry, Quantum Chemistry

Languages: English as a Second Language, Native Mandarin Speaker

Tools: PyTorch, OpenCV, Tensorflow, Keras, Scikit-Learn

Projects can be viewed on my GitHub: https://github.com/keevin60907