Tsai-Shien Chen

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Education

University of California, Merced — *Merced, CA*

PH.D. IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCE — *Aug. 2022 - Now*

- Work with Ming-Hsuan Yang, Tsung-Yi Lin, Hung-Yu Tseng and Chieh Lin.

National Taiwan University — *Taipei, Taiwan*

M.S. IN ELECTRONICS ENGINEERING — *Sep. 2019 - March 2022*

- Work with Shao-Yi Chien.
- GPA: 4.30 / 4.30, Rank: 1st / 128.

National Taiwan University — *Taipei, Taiwan*

B.S. IN ELECTRICAL ENGINEERING — *Sep. 2015 - Jun. 2019*

- GPA: 4.23 / 4.30, Rank: 5th / 190.

Research Interests

Deep Learning for Computer Vision

- Synthesis, Generation and Creation for Image, Video, and 3D data
- Representation Learning and Discriminative Model

Publications

1. **Incremental False Negative Detection for Contrastive Learning** [Paper]
   Tsai-Shien Chen, Wei-Chih Hung, Hung-Yu Tseng, Shao-Yi Chien, Ming-Hsuan Yang
   *International Conference on Learning Representations (**ICLR**), 2022*
2. **Hard Samples Rectification for Unsupervised Cross-domain Person Re-identification** [Paper]
   Chih-Ting Liu, Man-Yu Lee, Tsai-Shien Chen, Shao-Yi Chien
   *IEEE International Conference on Image Processing (**ICIP**), 2021*
3. **Tracklet-Refined Multi-Camera Tracking Based on Balanced Cross-Domain Re-Identification for Vehicles** [Paper]
   Kai-Siang Yang, Yu-Kai Chen, Tsai-Shien Chen, Chih-Ting Liu, Shao-Yi Chien
   *Conference on Computer Vision and Pattern Recognition (**CVPR**) Workshops, 2021*
4. **Orientation-aware Vehicle Re-identification with Semantics-guided Part Attention Network** [Paper]
   Tsai-Shien Chen, Chih-Ting Liu, Chih-Wei Wu, Shao-Yi Chien
   *European Conference on Computer Vision (**ECCV**), 2020 **[Oral Presentation]***
5. **Viewpoint-Aware Channel-Wise Attentive Network for Vehicle Re-Identification** [Paper]
   Tsai-Shien Chen, Man-Yu Lee, Chih-Ting Liu, Shao-Yi Chien
   *Conference on Computer Vision and Pattern Recognition (**CVPR**) Workshops, 2020*
6. **Supervised Joint Domain Learning for Vehicle Re-Identification** [Paper]
   Chih-Ting Liu, Man-Yu Lee, Chih-Wei Wu, Bo-Ying Chen, Tsai-Shien Chen, Yao-Ting Hsu, Shao-Yi Chien
   *Conference on Computer Vision and Pattern Recognition (**CVPR**) Workshops, 2019*

Research & Work Experiences

***Remote Cooperation* with UC Merced & Google** — *Online*

INCREMENTAL FALSE NEGATIVE DETECTION FOR CONTRASTIVE LEARNING [**ICLR'22**] — *Dec. 2020 - May 2021*

- Highlighted the unfavorable effect from false negatives for self-supervised contrastive learning.
- Proposed a strategy to incrementally detect more reliable false negatives when the embedding space becomes more semantically structural.

***Master Student* at National Taiwan University** — *Taipei, Taiwan*

DENSE CONTRASTIVE PRE-TRAINING ON LARGE-SCALE UNLABELED DATASET FOR SCENE TEXT RECOGNITION — *Sep. 2019 - March 2022*

- Built a large-scale unlabeled scene text dataset which contains around 8 million word boxes captured from 300 metropolises around the world.
- Introduced a novel dense contrastive learning framework to pre-train a strong scene text recognition model on the proposed dataset.

Orientation-aware Vehicle Re-identification with Semantics-guided Part Attention Network [**ECCV'20 (Oral)**]

- Proposed a network that can predict the localization of different vehicle views given only image-level labels during training.
- Proposed a distance metric that places greater emphasis on co-occurrence vehicle views when evaluating the feature distance of two images.

Viewpoint-aware Channel-Wise Attentive Network for Vehicle Re-Identification [**CVPRW'20**]

- Proposed an attention mechanism to make the framework channel-wisely reweigh each feature map based on the viewpoint of vehicle image.
- Explored the interpretability of how our channel-wise attention mechanism actually improves the learning framework.

Software Engineer Internship **at MediaTek** *Hsinchu, Taiwan*

- Explored a deep-learning algorithm for video encoding to increase the PSNR under light computation constraints. *July 2019 - Aug. 2019*

Software Developer Internship **at Industrial Technology Research Institute** *Hsinchu, Taiwan*

- Developed a software tool to simulate the wind force analysis *Jul. 2017 - Aug. 2017*

Undergraduate Student **at National Taiwan University** *Taipei, Taiwan*

Integrated Circuit (IC) Design: from Software to Hardware Development *Sep. 2015 - June 2019*

- Practicing a complete process of IC development, including (1) software design and verification, (2) RTL implementation, (3) gate-level synthesis, (4) placement and routing, and (5) taping out the custom IC chip.

Power Supply Circuit Design: Rectifier Implementation

- Made a mini fan that takes 110V AC as input and outputs 0V - 2.5V DC for controllable wind speed.
- Went through: (1) circuit design, (2) printed circuit board (PCB) making, (3) electrical component welding, and (4) circuit verification

Honors & Awards

2022	**Honorary Member (top 3% in college)**, Phi Tau Phi Scholastic Honor Society
2020-2021	**Intel and NTU IoX Center Scholarship**, Publication and Registration Grants for ECCV'20, CVPR'20, CVPR'21
2020	**Oral Paper (2% acceptance rate)**, European Conference on Computer Vision (ECCV), 2020
2019	**Valedictorian**, Department of Electrical Engineering, National Taiwan University
2015-2019	**4-time Presidential Award (top 5% in department)**, National Taiwan University
2019	**3rd place (out of 334 teams from 44 countries)**, CVPR Workshop: 2019 AI City Challenge (hosted by NVIDIA)

Professional Activities

Conference Reviewer	- Computer Vision and Pattern Recognition (**CVPR**): 2022
	- International Conference on Computer Vision (**ICCV**): 2021
Journal Reviewer	- IEEE Transactions on Intelligent Transportation Systems (**T-ITS**)
	- Neurocomputing
Teaching Assistant	- University of California, Merced: CSE185 **Introduction to Computer Vision** (Spring 2023)
	- University of California, Merced: CSE024 **Advanced Programming** (Fall 2022)
	- National Taiwan University: EEE5053 **Computer Vision** (Spring 2021)