

Tsai-Shien Chen

GRADUATE RESEARCHER AT NATIONAL TAIWAN UNIVERSITY

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Research Interests

Machine learning and deep Learning for Computer Vision, Image Classification and Recognition, Vehicle/Person Re-Identification

Education

National Taiwan University (NTU)

Taipei, Taiwan

BACHELOR IN ELECTRICAL ENGINEERING

Sep. 2015 - Jun. 2019

- **GPA: 4.23 / 4.30**
 - **Class Rank: 5th / 190**
 - **4 times of Presidential Awards** (top 5% of the students in the class) over 8 semesters
 - **Courses about Machine Learning (grades):** Machine Learning: Foundations* and Techniques* (A+), Deep Learning for Computer Vision* (A+), Introduction to Digital Speech Processing (A+), Machine Learning*(A+), Computer Vision*(A+)
 - **Courses about Algorithm (grades):** Algorithms (A+), Data Structure and Programming (A+), Computer Programming (A+)
- (* denotes graduate-level courses)

MASTER IN ELECTRONICS ENGINEERING

Sep. 2019 - (Ongoing)

- Researching in Media IC and System Lab instructed by Prof. Shao-Yi Chien

Publications

Orientation-aware Vehicle Re-identification with Semantics-guided Part Attention Network (Oral) | [Link](#)

Virtual

Tsai-Shien Chen, Chih-Ting Liu, Chih-Wei Wu, Shao-Yi Chien

Aug. 2020

Proceedings of the European Conference on Computer Vision (ECCV), 2020

Viewpoint-Aware Channel-Wise Attentive Network for Vehicle Re-Identification | [Link](#)

Virtual

Tsai-Shien Chen, Man-Yu Lee, Chih-Ting Liu, Shao-Yi Chien

Jun. 2020

Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2020

Supervised Joint Domain Learning for Vehicle Re-Identification | [Link](#)

California, U.S.A.

Chih-Ting Liu, Man-Yu Lee, Chih-Wei Wu, Bo-Ying Chen, Tsai-Shien Chen, Yao-Ting Hsu, Shao-Yi Chien

Jun. 2019

Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2019

Research and Work Experience

Graduate Researcher in Media IC and System Lab (instructed by Prof. Shao-Yi Chien)

Taipei, Taiwan

ORIENTATION-AWARE VEHICLE RE-IDENTIFICATION WITH SEMANTICS-GUIDED PART ATTENTION NETWORK [ECCV-20 (ORAL)]

- Proposed a network which 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.
- Outperformed state-of-the-arts in both the performance of re-identification and the quality of generated attention maps.
- Selected as an oral paper at ECCV 2020 (top 2% paper from over 5000 valid submissions).

VIEWPOINT-AWARE CHANNEL-WISE ATTENTIVE NETWORK FOR VEHICLE RE-IDENTIFICATION [CVPRW-20]

- Proposed an attention mechanism that enables the framework channel-wisely reweighing the importance of each feature maps according to the viewpoint of input vehicle.
- Conducted qualitative experiments to visualize how our channel-wise attention mechanism assists the learning framework.

SUPERVISED JOINT DOMAIN LEARNING FOR VEHICLE RE-IDENTIFICATION [CVPRW-19]

- Proposed a network to mitigate the domain gap between multiple training datasets due to misaligned feature distribution.
- Performed favorably against state-of-the-arts and ranks 18th among 84 teams in the 2019 AI City Challenge hosted by Nvidia.

Scientific Research Intern at MediaTek Inc.

Hsinchu, Taiwan

- Explored a deep learning based algorithm for video encoding which increases the PSNR value by 1.8dB while still meets the hardware computation constraints.

Jul. 2019 - Sep. 2019

Software Engineering Intern at Industrial Technology Research Institute

Hsinchu, Taiwan

- Developed a software tool in Matlab to simulate the wind force analysis which will support the customers choosing the components under safety requirement.

Jul. 2017 - Aug. 2017

Honors & Awards

- 2020 **Oral Paper**, European Conference on Computer Vision (ECCV), 2020
- 2020 **Intel and NTU IoX Center Scholarship**, Publication grant for ECCV 2020 and CVPR 2020
- 2019 **Valedictorian**, Department of Electrical Engineering, National Taiwan University
- 2015-2019 **4 times of Presidential Awards**, National Taiwan University
- 2019 **Ranked 3rd / 23 teams**, Track 3 of 2019 AI City Challenge (hosted by Nvidia Corp.)
- 2019 **2nd Place**, Deep Learning for Computer Vision: Final Project Contest
- 2019 **Top 13%**, Worldwide Kaggle Competition: Human Protein Atlas Image Classification
- 2018 **Ranked 4th / 200+ students**, Data Structure and Programming: Final Project Contest (hosted by Cadence Inc.)
- 2014 **Semifinal (Top 5%)**, International Physics Olympiad Domestic Semifinal

Selected Projects

Vehicle Re-Identification and Traffic Anomaly Detection System

2019/2020 CVPR WORKSHOP: AI CITY CHALLENGE

2019, 2020

- Designed a system which can match vehicle images of same identity captured from different camera and can also detect anomalies, such as lane violation, illegal U-turns and wrong-direction driving, etc.
- Got promising ranking in both 2019 and 2020 AI City Challenge and the papers were accepted.

Worldwide Kaggle Competition: Human Protein Atlas Image Classification

FINAL PROJECT CONTEST OF MACHINE LEARNING

2019

- Solved the problem of multi-label classification on 27 highly imbalanced protein patterns.
- Proposed an algorithm with AdaBoost and ensemble technique to cope with imbalanced dataset and ranked 1st in class / 279th in the world.

Speech Recognition System

FINAL PROJECT OF INTRODUCTION TO DIGITAL SPEECH PROCESSING

2019

- Built a complete speech process and recognition algorithm, including transformation from signal to spectrogram, computation of 39-dim MFCC, and CNN model for classification.

Speago: Voice Control Outfit Recommendation System

2017 MAKENTU HACKATHON

2017

- Implemented a smart closet which is controlled by an Android app. It would automatically pick up the recommended outfit based on the weather, temperature and the voice command of the user.

Skills

Languages	Mandarin Chinese, English
Operating Systems	GNU/Linux (Ubuntu), Mac OSX, Windows
Programming Languages	Python, C++, Git, Matlab, Verilog/System-Verilog, \LaTeX
Deep Learning Frameworks	Pytorch, Keras

More details can be found in my personal page: <https://tsaishien-chen.github.io/>.