Yao-Chih Lee

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Research Interests

Deep Learning for Computer Vision, 3D Computer Vision, Scene Understanding, Image/Video Processing

Education

National Taiwan University — Taipei, Taiwan
Master of Science in Computer Science and Information Engineering — Sep. 2018–Jun. 2020

- Thesis: "3D Video Stabilization with Depth Estimation by CNN-based Optimization" **[CVPR2021]**
  Committee: Yi-Ping Hung (advisor), Yung-Yu Chuang, Yu-Chiang Frank Wang, Chu-Song Chen, Kuan-Wen Chen
- GPA: 4.24/4.3
- Rank: 7th/132

National Chiao Tung University — Hsinchu, Taiwan
Bachelor of Science in Computer Science — Sep. 2014–Jun. 2018

- Network and Multimedia Engineering Program
- GPA: 4.14/4.3; (major) 4.2/4.3
- Rank: 1st/50
- Academic Excellence Award × 4 (top 5% ranking in the program)

Publications

1. **Yao-Chih Lee**, Kuan-Wei Tseng, Yu-Ta Chen, Chien-Cheng Chen, Chu-Song Chen and Yi-Ping Hung, "3D Video Stabilization with Depth Estimation by CNN-based Optimization," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021. [webpage, pdf]
2. Yu-Ta Chen, Kuan-Wei Tseng, **Yao-Chih Lee**, Chun-Yu Chen, Yi-Ping Hung, "PixStabNet: Fast Multi-Scale Deep Online Video Stabilization with Pixel-based Warping," *The 28th IEEE International Conference on Image Processing (ICIP)*, 2021. [pdf]
3. Hau Chu, Jia-Hong Lee, **Yao-Chih Lee**, Ching-Hsien Hsu, Jia-Da Li, Chu-Song Chen, "Part-aware Measurement for Robust Multi-View Multi-Human 3D Pose Estimation and Tracking," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops*, 2021. [pdf]
4. Ping-Jung Duh, Yu-Cheng Sung, **Yao-Chih Lee**, Kuan-Wen Chen, Liang-Yu Fan Chiang, "A Design of Vision-based Navigation System for the Visually Impaired," *ACM SIGCHI Taipei Chapter (TAICHI)*, 2018.
5. Yu-Cheng Sung, **Yao-Chih Lee**, Sarah Wang, Wei-Ting Hu, Kuan-Wen Chen, "An UAV Autopilot System for Sports Player Tracking," *ACM SIGCHI Taipei Chapter (TAICHI)*, 2017.

Experiences

Academia Sinica — Taipei, Taiwan
Research Assistant (full-time) advised by Prof. Chu-Song Chen — Sep. 2020–current

- Develop efficient and globally consistent video depth and camera pose estimation and outperform the state-of-the-art by 19% improvement. **[In submission]**.
- Develop real-time multi-view multi-human 3D pose estimation and tracking system **[CVPR Workshop 2021]**.
- Lead a research team of scene text spotting in self- and semi-supervised learning manners.

- Develop semi-supervised and conditional GAN-based metal artifact reduction for CT-MRI paired images.
- Develop image deblurring and denoising processes for multi-scale microscopy images.

Human-AI Interaction Research Project Taipei, Taiwan
Research Assistant (part-time) Jul. 2020–Aug. 2020

- Advised by Yi-Hsiu Chen (National Chengchi University, Taiwan), partially Chien-Wen (Tina) Yuan (National Taiwan Normal University, Taiwan) and Gary Hsieh (University of Washington, Seattle)
- Develop experimental websites of human-AI collaborative scenarios to serve over 700 participants **[In submission]**.

imLab at National Taiwan University Taipei, Taiwan
Graduate Research Assistant advised by Prof. Yi-Ping Hung Sep. 2018–Jun. 2020

- Develop the first 3D learning-based video stabilization algorithm with self-supervised depth and pose estimation and consistently outperforms the state-of-the-art methods, especially in severely-shaky videos. **[CVPR2021]**.
- Develop a real-time video stabilization algorithm in coarse-to-fine manner **[ICIP2021]**.
- Develop self-supervised monocular depth and camera ego-motion estimation algorithm.
- Conduct experiments and analyses on the performance of local feature algorithms in visual SLAM systems.

CoVis Lab at National Chiao Tung University Hsinchu, Taiwan
Undergraduate Research Assistant advised by Prof. Kuan-Wen Chen Aug. 2016–Jun. 2018

- Develop UAV autopilot and visual tracking system with OCR and human detection **[TAICHI2017]**.
- Develop semantic segmentation with video streaming in a visual navigation system for visually impaired **[TAICHI2018]**.
- Develop a semi-automatic annotation system of the real-world dataset for a viewpoint- and illumination-invariant local feature learning method.
- Develop semantic segmentation of 3D model and visual SLAM system for virtual reality headsets.

Teaching

- **3D Computer Vision with Deep Learning Applications (CSIE5429)** Spring 2021
  Teaching Assistant (Instructor: Chu-Song Chen) at NTU, Taiwan
- **Digital Image Processing (CSIE5612)** Fall 2019
  Teaching Assistant (Instructor: Yi-Ping Hung) at NTU, Taiwan
- **Probability (CSIE2121)** Spring 2019
  Teaching Assistant (Instructor: Yi-Ping Hung) at NTU, Taiwan
- **Computer Vision for UAV Autopilot (DCP1249)** Spring 2018
  Teaching Assistant (Instructor: Kuan-Wen Chen) at NCTU, Taiwan

Awards and Academic Activities

- **Reviewer**, Pattern Recognition
- **Academic Excellence Award** $\times$ **4**
  Top 5% ranking in Fall 2014, Spring 2016, Fall 2016, and Spring 2017
- **Undergraduate Project Competition Excellence Award**
  Project: An UAV autopilot system for sports player tracking
- **Departmental Core Course Scholarship**
  Top 3 ranking in the course of Operating System

Extracurricular Activities

- **Director at Midland of Taiwan Alumni Association** in NCTU
  Sep. 2015–Aug. 2016
- **Member at Computer Science Association** in NCTU
  Jun. 2015–May. 2016
- **Member at Tennis Team of the Computer Science department** in NCTU
  Sep. 2014–Jun. 2016
- **Member at Fire Dance Club** in NCTU
  Sep. 2014–May. 2015