

Research Interest

3D Computer Vision, Neural Rendering, Robotics Application

Education

- 2022–Present **National Taiwan University (NTU)**, Taiwan,
Master of Science in Computer Science Information Engineering.
- 2017–2021 **National Tsing Hua University (NTHU)**, Taiwan,
Bachelor of Science in Electrical Engineering.
GPA: 4.23/4.3, Rank: 1/102, **Summa Cum Laude (Top 1%)**
- 2019 **University of British Columbia**, Vancouver, Canada,
Summer Session.

Publications

- CVPR 2022 **NeurMiPs: Neural Mixture of Planar Experts for View Synthesis**, [📄 project](#).
Zhi-Hao Lin, Wei-Chiu Ma*, **Hao-Yu Hsu***, Yu-Chiang Frank Wang, Shenlong Wang

Experience

- Sept. 2021 – **Vision & Learning Lab**, National Taiwan University, Taipei, Taiwan.
Present **Research Assistant, Advisor: Prof. Yu-Chiang Frank Wang**
- Proposed a novel 3D representation that represents scenes with multiple learnable planes for novel view synthesis.
 - Implemented custom CUDA kernel for rendering efficiency. Achieved 60x speedup on rendering indoor scenes.
 - Outperformed NeRF and MPI methods in extreme view extrapolation.
 - Resulted in one publication at CVPR 2022.
- Sept. 2019 – **Vision & Science Lab**, National Tsing Hua University, Hsinchu, Taiwan.
June 2020 **Undergraduate Researcher, Advisor: Prof. Min Sun**
- Studied papers in fields of Computer Vision, Natural Language Processing and Reinforcement Learning
 - Proposed a method to improve recovering low-resolution face images in super-resolution tasks.
- July 2020 – **Industrial Technology Research Institute (ITRI)**, Hsinchu, Taiwan.
Sept. 2020 **AI Intern, Computational Intelligence Technology Center**
- Worked on optical character recognition for scanned images of client receipts.
 - Studied various methods like traditional image processing algorithm and DL-based method and implemented them in Tensorflow & PyTorch.
 - Improved the accuracy to 88% in text localization part by utilizing SOTA deep learning method.

Honors & Awards

- 2017 – 2021 **Dean's List Award (4 times)**, – Top 5% GPA in each semester.
- 2019 **Summer Oversea Experience Scholarship**, – Only 10 student in NTHU EE Department.
- 2021 **Phi Tau Phi Scholastic Honor Society Honorary Membership**, – Graduated top 1% in NTHU EE Department.
- 2020 **First Place in DataLab Cup**, – Kaggle Competition in CS5656 Deep Learning, NTHU.

Selected Projects

- 2020 **Real Time Face Recognition System**, | *Python, OpenCV, Keras*.
- Utilized OpenCV for face detection and CNN architecture (i.e. FaceNet) for face feature extraction
 - Trained a SVM classifier on extracted face features on self-collected dataset
 - Deployed on webcam to perform end-to-end real time face recognition task
- 2020 **AniBall**, | *Unity, C#, Blender*.
- Developed a multi-player party game in Unity
 - Implemented several game effects (like particle effects, mesh deformation during collision)
 - Crafted 3D models of animals from scratch in Blender
 - **Honorable Mention Project in Game Programming, NTHU**
- 2021 **Dart Score Solver**, | *Matlab*.
- Developed a Matlab program for dart score estimation on captured dartboard images
 - Utilized digital image processing techniques for score region segmentation and dart location estimation
 - Implemented RANSAC with SIFT features to calibrate two input images for better estimation
- 2021 **Parallel Low-Poly Image Generation**, | *C++, CUDA, OpenCV*.
- Developed a program in C++ to generate low-poly style images
 - Utilized CUDA library to parallelize the sequential code for performance improvement

Teaching Experience

- Mar. 2020 – **National Tsing Hua University**, Hsinchu, Taiwan,
June 2020 Teaching Assistant for EE2450 Embedded System Laboratory.
- Improved quality and impact of course materials with real-world examples such as vision on microcontroller.
 - Co-designed assignment, exam, and final project, and provided one-on-one instructions for over 70 students

Technical Skills

- Languages Mandarin (native), English (TOEIC: 890, GRE: 328)
- Programming Python, C/C++, C#, JavaScript, HTML/CSS, MATLAB, Verilog
- Frameworks Scikit-learn, PyTorch, Tensorflow, Git, Unity, GCP

Relevant Courses

Data Structure, Algorithms, Operating System, Computer Architecture, Computer Networks, Machine Learning, Deep Learning, Game Programming, Parallel Computing, Database Management, Discrete Mathematics

Extra Curriculars

- 2019-2021 **Department Men Basketball Team**, *Vice Captain*.