DING-JIUN HUANG

Personal Website ◇ djhuang322@gmail.com

EDUCATION

National Taiwan University, Taiwan *September 2019 — June 2023*
Bachelor of Computer Science and Information Engineering
- Overall GPA: 4.17/4.3, Last-60 GPA: 4.19/4.3
- **Relevant Coursework**: Machine Learning* , Deep Learning for Computer Vision*, Data Structure and Algorithms, Applied Deep Learning*, Computer Graphics*, Intro. to Computer Networks, Operating Systems, Sytem Programming, Linear Algebra, Discrete Mathematics * denotes graduate-level

RESEARCH EXPERIENCE

National Taiwan University, Vision and Learning Laboratory *July 2023 — Present*
Undergraduate Researcher, Advisor: Prof. Yu-Chiang Frank Wang
- **Topic: High-Quality Neural Radiance Field with Super-Resolution (SR)**
- Designed a novel framework for SR of voxel-based radiance fields. Trained with low-quality training views, our proposed ASSR-NeRF can render high-quality novel views with richer details and multi-view consistency.
- Proposed an attention-based VoxelGridSR module to enable SR at arbitrary scale, and achieved significant 1.8% PSNR score and 6% LPIPS score improvements over baseline method with SR scale x2 in LLFF dataset.

Arizona State University, Make Programming Simple Laboratory *February 2022 — June 2023*
Undergraduate Researcher (Remote Collaboration)
- **Topic: Motion Planning for Autonomous Vehicles (AVs)**
- Given waypoints of several autonomous vehicles in future time frames, our proposed algorithm aimed to efficiently detect collisions, benefiting real-time decision-making of autonomous vehicles.
- Our method can be applied to hybrid traffic, an environment containing both autonomous and human-driven vehicles.

National Taiwan University, Cyber-Physical Systems Laboratory *July 2022 — June 2023*
Undergraduate Researcher, Advisor: Prof. Chung-Wei Lin
- **Topic: Consensus-Based Platooning for Autonomous Vehicles (AVs)**
- Designed a robust communication protocol for AVs in platooning to exchange position and speed information.
- Specifically, a fault-tolerant controller can first detect and exclude faulty information resulting from malicious attacks or device errors, then reinstate the platooning through controller-gain adjustments.
- Our method can reinstate platooning that has faulty position information with 43% reduction in settling time over SOTA method and minimize position state error under 0.01 (m).

KKCompany, Advanced Research Center *July 2022 — June 2023*
Research Engineer Intern, Advisor: Dr. Shuen-Huei Guan
- **Topic: Video Quality Assessment (VQA) for Video Enhancement**
- Proposed a temporal-attention-based novel framework for VQA of video content enhanced by deblurring, relighting or super-resolution. Compared to SOTA method using SRCC, our approach achieved an average 1.5% improvement and 2.6% improvement on enhanced video dataset, VDPVE.
- Constructed a dataset of professionally generated content for VQA to facilitate applications in industry, and utilized YouTube heatmap to analyze the relationship among VQA predictions, video quality and degree of appeal to users.

PUBLICATIONS

[1] **Ding-Jiun Huang**, Zi-Ting Chou, Yu-Chiang Frank Wang, Cheng Sun. "ASSR-NeRF: Arbitrary-Scale Super-Resolution on Voxel Grid for High-Quality Radiance Fields Reconstruction"
IEEE/CVF CVPR 2024 **Under Review**

[2] **Ding-Jiun Huang**, Yu-Ting Kao, Tieh-Hung Chuang, YaChun Tsai, Jing-Kai Lou, and Shuen-Huei Guan. "SB-VQA: A Stack-Based Video Quality Assessment Framework for Video Enhancement"
IEEE/CVF CVPR NTIRE 2023 **Accepted**

[3] Tzu-Yen Tseng, **Ding-Jiun Huang**, Jia-You Lin, Po-Jui Chang, Chung-Wei Lin, Changliu Liu. "Consensus-Based Fault-Tolerant Platooning for Connected and Autonomous Vehicles"
IEEE Symposium on Intelligent Vehicle (IV) 2023 **Accepted**

HONORS AND AWARDS

Most Promising Research Work by Appier, NTU CSIE Research Projects Exhibition 2021
Presidential Award as Top 1% Student, NTU 2020
Outstanding Teaching Assistant, NTU CSIE 2021

WORK EXPERIENCE

KKCompany, Advanced Research Center *July 2022 — June 2023*
Research Engineer Intern

- Conducted research of video enhancement tasks to enhance the content of company's video streaming service, leading to quality improvement of 1.2 dB in PSNR for testing film data.
- Integrated diffusion-based model with a swin-transformer-based SR module and modified training objectives, obtaining an SR method that surpasses all SOTAs in VSR task.
- Created a pipeline to enhance video content in our database automatically.

HPAIR Harvard Conference 2021 *September 2020 — August 2021*
Software Engineering Associate

- Managed website and database with Javascript in collaboration with computer science majors from Harvard University.
- Built up online meeting environments to help organizing an online conference with 1000+ participants and speakers including the presidents of several countries and Nobel Prize Winners.

SELECTED PROJECTS

Reinforcement Learning with In-Memory Computing *September 2021 — June 2022*
Research Project, Advisor: Prof. Tei-Wei Kuo

- Designed a ReRAM-based accelerator as well as a gate-level pipeline to improve the efficiency of reinforcement learning to mitigate the memory bottleneck problem with Von-Neumann architecture.
- Reduced the overhead to move heavy model weights between GPU and memory devices, the proposed method reaches an x2.1 speedup in training.

JetFinger: Devices for Immersive Gaming Experience *September 2021 — June 2022*
Research Project, Advisor: Prof. Mike Y. Chen

- Aimed to create a VR sword fighting game with immersive gaming experience by producing realistic feedback on users' VR handheld.
- Designed an air-propulsion device attached on VR handheld, creating reaction force whenever user hits something with a sword in the game.

NASA Monitoring System *March 2021 — August 2021*
Engineering Project

- Built a web service to monitor all the servers of the Network and System Administration (NASA) team at NTU CSIE, leveraging techniques including Prometheus, Grafana, LDAP, Proxy Configurations.
- Configured the Proxy, LDAP and IP settings among the machines of different groups in NASA team.

TEACHING EXPERIENCE

Data Strucutre and Algorithm, course at NTU *March 2021 — June 2021*

- Designed assignments of algorithms for more than 150+ students in this compulsory course for CSIE majors and taught students with advanced data structures and algorithms in scheduled TA hours.
- Received Outstanding Teaching Assistant Award by NTU CSIE.

Network Administration and System Administration, course at NTU *September 2021 — June 2022*

- Taught students about applications related to network and system administration including firewall, DNS, web service, virtual machine management with hands-on implementations as TA.

NTU Shepherd Project *Spring 2023*

- In both online courses and in-person classes, taught a total of 300 high school students topics including data structure and algorithm, web service, machine learning.
- Designed interactive learning materials such as online playgrounds for HTML, CSS, Javascript and image classification challenge with PyTorch.

EXTRACURRICULAR ACTIVITIES

Minister of Activities Department, NTU CSIE Student Council *September 2021 — June 2022*

- Hosted NTU CSIE camp, a 6-day event including courses as well as activities for high school students, as the main coordinator.
- Hosted EECS Music Festival, an event involving performances by professional musicians as well as student bands with 500+ audiences.

Member of Tennis Team, College of Management *September 2021 — June 2022*

- Helped organize courses as well as tennis competitions at NTU college of management.
- Participated in NTU Tennis Competition, an annual tournament with 50+ participants.