Hong-En Chen

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EDUCATION

Department of Electrical Engineering, National Taiwan University **Taipei, Taiwan**
B.S. in Electrical Engineering **Sep 2019 – Jun 2023**
Overall GPA: 4.09 / 4.3
Core Courses: Machine Learning(A+) / Deep Learning for Computer Vision(A+) / Computer Architecture(A+) / Algorithms(A) / Differential Equation(A) / Linear Algebra(A+) / Web Programming(A+) / Introduction to Computer Network(A+)

PUBLICATIONS

- **Hong-En Chen***, Bin-Shih Wu*, Sheng-Yu Huang, Yu-Chiang Frank Wang, "TPA3D: Triplane Attention for Fast Text-to-3D Generation", under review in European Conference on Computer Vision **(ECCV'24)**
- Wei-Hsin Wang, **Hong-En Chen**, Mike Y. Chen, "UltraBat: An Interactive 3D Side-Scrolling Game using Ultrasound Levitation", User Interface Software and Technology **(UIST'22)**

RESEARCH EXPERIENCES

Vision and Learning Lab | National Taiwan University **Sep 2021 - Present**
Advisor: Professor Yu-Chiang Frank Wang, Department of Electrical Engineering, NTU

- Participated in investigative studies and practical trials on point cloud completion and NeRF.
- Proposed a text-guided 3D framework to retrieve detailed visual descriptions for synthesizing corresponding 3D textured shapes within seconds, especially in the absence of text-3D paired data.
- Utilized attention to apply word-level refinement on feature triplanes, guided by pseudo captions generated by InstructBLIP.
- Outperformed existing text-to-3D methods on the ShapeNet dataset with a 10% increase in fidelity (FID) and a 5x improvement in text-shape consistency (CLIP-R-precision).

Trustworthy Machine Learning Lab | University of California San Diego | Visiting Student **Jun 2022 - Present**
Advisor: Professor Tsui-Wei (Lily) Weng, Halıcıoğlu Data Science Institute, UCSD

- Applied Net-Dissect and MILAN to dissect models trained by robustness-enhanced strategy to observe the discrepancies in the category distribution of neurons.
- Proposed to dissect with model weight and observe the frequency domain using the Fourier transform.
- Successfully inspected the functionality of neurons in ResNet50 early layers in seconds without expensive GPU resources.

COMPETITION EXPERIENCES

MakeNTU | Nationwide hackathon contest aims at software and hardware integration
Best Maker Award | Project I: IoT Streetlamp System with AI Human Fall Alert System **Mar 2022**

- Designed a real-time full-stack app to visualize sensor data and set up a pose estimation model to alert potential human falls.
- Established the communication between hardware controller(STM32) and backend through MQTT protocol.

Best Application Award | Project II: Real-Time RGB-D Arm Pose Guided Laser Pointer **May 2023**

- Applied YOLOv5 to locate the position and depth of arm joints on RGB-D images captured by RealSense camera.
- Optimized inference efficiency with Optical Flow to achieve 60+ frame rate on a laptop CPU.

UIST 2022 SIC | User Interface Software and Technology Conference Student Innovation Contest **Nov 2022**
UltraBat: An Interactive 3D Side-Scrolling Game using Ultrasound Levitation

- Brought the arcade game into the real world by precisely controlling the character with provided ultrasound levitation kits.
- Designed the game logic in C# and adapted it to the Unity interface along with controller firmware.
- Achieved 4x update frequency by customizing the firmware code regarding trajectory computing and multithreading in C++.
- Demonstrated our design to leading researchers and had our poster published on the ACM conference's digital library.

LEADERSHIP / WORK EXPERIENCES

Teaching Assistant | Machine Learning (Instructor: Prof. Hung-yi Lee) **Feb 2022 - Jun 2022**

- Designed assignments and provided a code base for students to practice different domain adaption strategies.
- Proposed visualizing feature spaces with t-SNE for students to observe the changes across domains and classes.
- Held TA hours twice a week to help students with machine learning programming and implementation issues.

Team Leader | Digital Archive, Biography Website (Instructor: Prof. Lin-shan Lee) **Apr 2021 - Present**

- Implemented the website architecture with Gatsby framework(React based) and programmatically generated hundreds of static web pages with templates.
- Managed the project for infrastructure setup, Continuous Integration/Continuous Deployment(CI/CD), and version control.
- Facilitated effective communication and collaboration among the professor, design team, and software team.

Team Leader | Deep Learning for Computer Vision (Instructor: Prof. Yu-Chiang Frank Wang) **Sep 2021 - Jan 2022**

- Extracted and identified the location of pulmonary nodules from volumetric raw CT scans.
- Applied 3D Faster R-CNN for region proposal by conducting pixel-wise multi-scale learning.
- Utilized pixel-wise labeling with Unet to enable effective candidate nodule generation.

Software Team Leader | Light Dance **Sep 2021 – Jan 2022**

- Designed the structure of the whole software system to organize the web editor, Raspberry Pi, and hardware controller.
- Implemented 3D(Three.js) Editor UI to simulate and co-edit light effects on virtual dancers in 3D scenes.
- Cooperated with the hardware team to achieve low latency and synchronization between the light and music.
- The performance received over 330k views and garnered coverage in four news outlets.

Minster | Information Department of EE Student Association **Sep 2021 – Sep 2022**

- Planned weekly courses and designed web services, information security, and systems management material.
- Led and Released a course selection website by properly assigning tasks and coordinating among 10 team members.
- During peak times, the website proficiently handled the influx of 500 students, ensuring a seamless course selection process.

EXTRACURRICULAR ACTIVITIES

Minister, Information Department of EE Student Association	**2022**
Leader, MakeNTU Website Section | National Taiwan University	**Jan 2021**
Badminton Team Member of EE Department | National Taiwan University	**2020**
Student, | Churchill House, United Kingdom	**Jul 2019**

SKILLS

Areas of Expertise: Computer Vision / Machine Learning / Deep Learning / Web Programming / Embedded System

Programming Languages: Python / C++ / C# / JavaScript / WebGL / OpenGL / HTML / CSS / SQL

Machine Learning Packages: PyTorch / SciPy / Keras / Sci-kit / OpenCV

Embed Systems: Jetson Nano / Raspberry Pi / STM32 / ESP modules / Arduino

Web-related Packages: TypeScript / React / Gatsby / GraphQL / Three.js / Redux / Express

Dev Tools & Operating Systems: Docker / LaTeX / Linux(Ubuntu, Arch) / MacOS / Windows

Language: Chinese Mandarin (native), English (fluent, TOEFL 104 L:30, R:28, W:24, S:22 / GRE 320 V:151, Q: 169, AW: 3.5)