Hsi-Sheng Mei

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Education

New York University, New York, NY — Sep 2019 – May 2021
Master of Science in Computer Science (Courant Institute), GPA: 3.9/4.0

National Taiwan University, Taipei, Taiwan — Sep 2014 – Jan 2019
Bachelor of Science in Electrical Engineering, GPA: 3.6/4.3

Experience

NYU Future Reality Lab, New York, NY — Jan 2021 – Present
Student Researcher

- **Gesture Recognition:** Streamlined hand keypoint data from hand tracking VR devices in Unreal Engine 4 (UE4) in C++ to a standalone Python server for real-time gesture recognition.

Developer — June 2020 – Aug 2020

- Collaborated with lab members on the VR project presented in **SIGGRAPH 2020** with UE4.
- Developed a point and detect functionality in C++ for handheld VR controllers to interact with objects.
- Animated environment objects with vertex shaders using HLSL.

Foxconn, Taipei, Taiwan — Nov 2017 – June 2018
Software Engineer Intern

- Developed the web dashboard of OpenStack with **Python** for users to call custom scripts on virtual machines.
- Solved an issue where the event counter on the dashboard gives inconsistent numbers.
- Configured **Ansible** playbooks for OpenStack deployment in containers.

Projects

Optimizing Transposed Convolutions on GPUs [C++, CUDA] — Dec 2020

- Parallelized transposed convolutions with input-stationary reuse policy using CUDA.
- Devised an output-grouping dataflow to reduce synchronization overhead of partial sums accumulation.
- Achieved 747x and 1.53x speedup compared to C++ CPU and PyTorch implementations.

Transactional Data Structure Libraries [C++, OpenMP] — May 2020

- Revamped common data structures to handle multi-operation transactions consistently in parallel execution.
- Applied fine-grained locks to resolve race conditions while achieving higher concurrency.
- Improved performance by 30% for queues and sorted lists under concurrent workloads.

Gingerbread House VR [JavaScript, WebGL] — Dec 2019

- Created a multiplayer VR experience with a team of 5 and demo-ed in class with 20+ participants.
- Designed the collision detecting mechanism for players to drop and stack objects.
- Implemented the message passing system to synchronize scene object locations in view of different players.

Photorealistic Rendering of Soap Bubbles [C++, Ray Tracing] — Dec 2018

- Created a plugin for iridescent materials in a path-traced physically-based renderer *Photon-v2*.
- Devised a table-lookup strategy for rendering iridescence by pre-computing the reflectance from Fresnel equations.

Sentiment Classification of Human Faces [Python, Keras, Deep Learning] — May 2018

- Applied deep learning models based on VGG-16/19 and ensembled with voting classifier.
- Ranked top 15% in the Kaggle contest among 110 students in the Machine Learning class of NTU.

Web Crawler for Taiwanese Internet Forums [Python, BeautifulSoup, Matplotlib, MySQL] — June 2017

- Built a web crawler to scrape posts from HTML pages of Taiwanese internet forums, streamlined to MySQL.

Skills

Languages: C++, Python, C, JavaScript, HTML, CSS, Bash Script
Tools: Docker, Git, Visual Studio, Conda, PyTorch, Keras, Scikit-Learn, Numpy, Pandas, OpenMP, MPI, CUDA, SQL
Graphics: Unreal Engine 4, OpenGL, WebGL, LibIGL, Blender

Others

NTU Go Club - Gave advanced lessons of Go and held tournaments for club members. — 2015 - 2017
NTU Coffee Club - Instructed coffee brewing techniques to 60+ members. — 2015 - 2016