Li-Wen Lin

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SKILLS

Languages & Techniques	***C/C++, C#***, Python, JavaScript, Shell Script, MATLAB, Object-Oriented Programming
Frameworks & Libraries	***OpenGL, WebGL, GLSL***, OpenCV, Vue.js, Eigen, PyQT, PyTorch, Unity, Unreal
Environments & Tools	Ubuntu, Virtual Environment, ***Nvidia Nsight GPU profiler, Visual Studio profiler***, Git

EXPERIENCES

SING Lab | **Student Researcher** *Supervised by Prof. Michael Neff* — Davis, CA | June 2023-Present

- Developing a ***VR avatar*** motion record/replay application in ***Unity*** using ***C#*** and Meta Avatar SDK.
- Implementing a BVH file editor that can merge multiple 3D human ***skeletal animation*** using ***C++*** and ***OpenGL***.

CGV Lab | **Student Researcher** *Supervised by Prof. Hung-Kuo Chu* — Hsinchu, Taiwan | Sep. 2020-June 2021

- Developed a 3D model placement on real-world footage program using ***image segmentation*** and ***gradient descent***.
- Communicated with industrial collaborators and supervisor on weekly basis about current project issues, resolutions, and system performance.
- Automated project pipeline via ***Shell Script***, resulting in ***20% reduction*** of testing time.

National Tsing Hua University | **Teaching Assistant** — Hsinchu, Taiwan | Sep. 2020-Jan. 2021

- Resolved 40+ students' questions in "Computer Graphics and Application" course, increasing overall scores by 20%.
- Lectured topics on GLUT, ***scene rendering, Blinn Phong Lighting***, and ***fragment shaders*** in ***OpenGL***.
- Reduced 50% grading time by creating collaborative spreadsheets that incorporated multiple grading metrics.

BioPro Scientific | **Firmware Development Intern** — Hsinchu, Taiwan | July 2019-Sep. 2019

- Developed functions in C for ***embedded devices*** that calibrate and convert ***bit signal*** of voltages to readable data.
- Collaborated with developers via Git; refactored legacy code, achieving ***30% size reduction*** of source code.

PROJECTS

Real-Time Hardware Ray Tracing Renderer

- Implemented ray tracing algorithm on CPU (***C++***) and ***GPU*** (***OpenGL fragment shader***) sides; compared performance and fidelity between two versions; ***increased performance from 0.16 FPS to 144 FPS.***
- ***Accelerated 2x computation speed*** of CPU ray tracing by distributing render workload to ***multiple threads***.
- Set up material and object base classes to support ***polymorphism*** of a variety of materials and interactable shapes.
- Included ***ImGui*** and created keyboard callback function for user to ***control camera*** moving around the 3D scene.

Climbing System in Unreal

- Extended the character movement component base class in Unreal and implemented ***climbing logic fully in C++.***
- Detected surfaces using ***Shape Sweep*** and applied ***Blendspace animation*** for visually smooth direction changes.

Tetris on Self-Designed RISC-V Game Console

- Developed ***system call APIs*** in ***C++*** and ***Assembly*** for drawing sprites; recreated fully functional Tetris with the API.
- Controlled game flow by a state machine, resulting in ***90% acceleration*** of response time and eliminated crashes.

Treasure-Hunt Game in OpenGL

- Generated terrain using ***height map***; implemented ***normal mapping***, ***differential rendering*** for realistic game scene.
- Incorporated ***collision detection***, ***particle system*** and ***fire simulation*** in object-oriented manner.

EDUCATION

University of California, Davis — Davis, CA | Sep. 2021-Dec. 2023 (Expected)

MS in Computer Science — GPA: 3.9/4.0

Relevant Courses: ***Applied Linear Algebra***, Character Animation, Geometric Modeling, Computational Design

National Tsing Hua University — Hsinchu, Taiwan | Sep. 2016-June 2021

BS in Computer Science, minor in Foreign Language and Literature — Senior GPA: 3.66/4.3

Relevant Courses: Algorithm, Data Structure, Operating Systems, Computer Architecture, ***Computer Graphics***

ACTIVITIES & LEADERSHIP

Meichu Game Preparation Committee | **Chairperson and Publicity Manager** — July 2019-May 2020

- Led 30 members to hold the official sports event between NTHU and NCTU and attracted 5000+ audiences.

ANUT 3D Animation Studio | **President** — July 2017-June 2018

- Created storyboard and composited scenes that were modeled and rendered with Cinmema4D as final compositor.
- Coordinated production schedule among a four-member team, enabling us to publicly showcase our animation.

Summer Universiade 2017 | English Translation Volunteer — July 2017

- Provided assistance for international athletes regarding stadium information and Mandarin translation.