Li-Wen Lin

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SKILLS

Languages & Techniques	***C/C++, C#***, GLSL, Python, ***Object-Oriented Programming***, Reinforcement Learning
Tools & Libraries	***Unity, Git, OpenGL***, WebGL, Eigen, OpenCV, PyQT, PyTorch
Environments & Software	Ubuntu, Blender, Maya, Cinema 4D, After Effects

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.

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: Programming, Algorithm, Data Structure, Operating System, Software Studio, ***Computer Graphics***

PROJECTS

Real-Time Hardware Ray Tracing Engine — On Going

- Accelerated the rendering process by implementing ray tracing inside ***fragment shader*** with OpenGL and GLSL.
- Set up material class for metal/glass objects and added interactable camera to walk around the 3D space.

3D Quadruped Walking via Deep Reinforcement Learning in Unity — June 2023

- Set up compound colliders and joints' DOF on a rigged model and registered them into action space for training.
- Designed reward functions, succeeding in training a cat model to perform natural posture using PPO algorithm.

3D Truss Optimization — May 2022

- Derived and implemented displacement-based compliance minimization algorithm; solved equilibrium using ***sparce Cholesky factorization*** to generate self-supporting cantilever and ***visualized it using OpenGL***.

Tetris on Self-Designed RISC-V Game Console — Dec. 2022

- 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 — Jan. 2020

- 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.

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.