Ziyi Lu

18888915727 | ziyilu@zju.edu.cn | https://luniumluk.github.io/

Education

Zhejiang Unversity Hangzhou, Zhejiang

MSE in Software Engineering Sept. 2022 – March 2025

- GAPS Lab, State Key Laboratory of CAD & CG, Zhejiang University.
- Outstanding graduate student scholarship.
- Supervised by Assoc. Prof. Yanlin Weng and Assoc. Prof. Zhong Ren

BSE in Digital Media Technology Sept. 2018 – Jun 2022

- GPA: 3.96/4.0 top 10%. A first scholarship and a third scholarship, outstanding graduates and outstanding thesis.
- Undergraduate thesis: *High-quality hand model reconstruction based on a consumer-level depth camera*

Coursework

- Computer Graphics, Advanced Capmputer Graphics, Computer Animation, Game Design and Development, 3D Scene Modeling, GPU Parallel Programming, Image Processing, Computer Vision.

Experience

FaceUnity technology Nov. 2021 – Now

Software Engineering Intern (Digital Double team, under Zhong Ren) Hangzhou

- Developed a realtime interactive chatting application for high-fidelity digital double. Including core application (**written in C++ with multithreading to handle heavy management in realtime**), frontend and backend application (**written in Javascript with Nodejs**) and automated DCC pipeline (**Maya, Blender and Unreal python plugin**)
- Developed a **vulkan-based renderer for experimenting realtime face rendering techniques**, implemented Screen Space Refraction, Separable SSS and more.
- Developed a hand geometry and texture reconstruction algorithm based on a single RGB-D camera. **Implemented the algorithm (using pytorch and OpenGL) and assembled the hardware**. Currently the system has been integrated into the high-fidelity digital double capture system.

Tencent IEG 2022/2024

Computer Graphics Research Project Online

- Research on topic: *Rasterization-based Differentiable Rendering techniques*, implemented a PBR renderer based on nvdiffrast to optimize PBR textures on assets with simplified mesh.
- Research on topic: *AI-based parameterized 3D garment modeling and simulation techniques*, implemented dataset generation pipeline using GarmentCode.

Booming Tech July 2021 – Sept. 2021

Game Engine Developing Intern (Toolchain team) Hangzhou

- Explore and documented **Inverse Kinematics Systems** on major game engines and implemented some IK algorithms (Jacobian, CCD and FABRIK) on Chaos Engine.
- Developed a basic **Animation Editor** (Written in C#) as a part of the toolchain of Chaos Engine.

Research and Engineering

Fast Face Asset Reconstruction (Patent of Faceunity)

- A hierarchical algorithm via mixture of neural-based and multiview stero method for fast reconstruction of face geometry and PBR material. **Obtaining topology, semantic consistent and sub-milimeter geometry in seconds and 2K PBR textures (Diffuse/Specular/Normal) in a few dozens of seconds**.
- Created a face multiview stereo dataset using MetaHuman of Unreal Engine.

Path Tracer https://github.com/LuniumLuk/Tira

- **A tiny CPU (C++)/GPU (OpenGL compute shader) path tracer** project for course work, featuring Whitted/Monte-Carlo/Bi-directional path tracing algorithm.

Software Rasterizer https://github.com/LuniumLuk/soft-renderer

- A tiny C++ software renderer built from scratch with minimum dependencies, featuring Extendable shader, MSAA, Cross-platform and so on.

Spherical Harmonic Area Lights https://github.com/LuniumLuk/AnalyticSHAreaLight

- Personal implementation of paper: *Analytic Spherical Harmonic Coefficients for Polygonal Area Lights.*, implemented **zonal harmonics compression (pytorch), PRT precalculation (mitsuba), rendering (OpenGL)**.

Octree acclerated Hierachy Z-Buffer https://github.com/LuniumLuk/Z-Buffer

- Implemented octree acclerated hierachy Z-buffer algorithm with C++.

Strand-based Hair Rendering

- Implemented strand-based hair rendering with OpenGL (import bezier curve as hair strand and generate geometry with tessellation and geometry shader) using Kajiya and Marschner model.

Awards

Mobile Application Innovation Contest Dec. 2021

- We won the second prize of the Mobile Application Innovation Contest 2021 with our AR music app: *MuseFall*.

International Youth Social Anti-Corruption Advertising Competition Dec. 2019

- We won the second prize of the International Youth Social Anti-Corruption Advertising Competition 2019 for our video clip: *Together against corruption: Tango* and received our award at Moscow, Russia.

Skills & Interests

Programming Languages: C/C++, GLSL, Python, Javascript/HTML/CSS, CUDA, Swift.

Software/Tools/API: OpenGL, Vulkan, WebGL, Pytorch, Unreal, Unity, Maya, Blender, Git, Visual Studio, Photoshop, Marmoset Toolbag, Wechat miniprogram, XCode.

Foreign Language: English (TOEFL 110), Japanese (JLPT N2)

Interests: Badminton, Piano & Classic Music, PC Games (RPG, open world, simulation)