Yangming Zhang

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Education

Georgia Institute of Technology **Atlanta, GA**
M.S. in Computer Science • GPA 4.0/4.0 12/2022 – 12/2023
Deep Learning for Robotics, Advanced Computer Graphics, 3D Vision, Game AI, Graph Deep Learning

Georgia Institute of Technology **Atlanta, GA**
B.S. in Computer Science • GPA 4.0/4.0 08/2019 –12/2022
Machine Learning, Deep Learning, Computer Graphics, Computer Animation, Robotics, Game Engine, PCG

Professional Experience

Samsung Research America **Mountain View, CA**
Computer Graphics Intern *05/2023 – 08/2023*
- Worked in the IMEX lab focusing on Samsung XR headset. Supervised by Christopher Peri, and Eugene Xiong.
- Implemented a testbed Vulkan renderer to test VST (video-see-through) algorithms, such as CAC, GDC, depth viewport matching, LSR (Rotational, Planar, Depth), VST with Foveation and more.
- Implemented renderer features YCbCr conversion, and single pass multiview rendering, compute pipeline, and more.
- Optimized Qualcomm camera code to minimize artifacts. Synchronized VST frame with AndroidXR CPM framework.
- Investigated causes of camera and tracking system latency and record discoveries in the internal wiki.

Active.ai **Remote, Singapore**
Machine Learning Engineer Intern *05/2021 – 08/2021*
- Worked with enabling technology team that provides smart virtual avatar to users as custom service.
- Worked on a monocular real-time face tracking PyTorch model that utilized a learned dynamic rigidity prior. Solved many engineering issues during model training and inference.
- Worked on a stable diffusion model to generate background for the virtual scene.

Georgia Tech Create-X **Atlanta, GA**
Researcher *01/2020 – 12/2023*
- Initiated a student-led research project, Treasure, via the Create-X program. Advised by prof. Greg Turk and prof. Mark Riedl.
- Researched on PBR/NPR light transport and material model, inverse rendering to find solutions to the rendering equation and recover possible BSDFs via DL models. Experimented with several NeRF models. Worked on SLAM/VIO in Augmented Reality.
- Implemented C++ Vulkan rasterizer, C++ Path with full PBR process, PyTorch Path Tracers that allows inverse rendering with DL models, C++ SLAM/VIO fundamentals. Experimented with several NeRF models using NeRF Studio, and Genshin Impact style NPR rendering.

Plug and Play Tech Center **Beijing, China**
Technical Consultant Manager – AI Direction *08/2016 – 08/2019*
- Shifted position to support investment team and offer technical assessment of startups. Evaluated 2,000 tech startups across China, joined 420 startup due diligence, and led 30 seed-stage investments. Focused on startups leveraging CG, CV and deep learning.

AIGC Researcher *11/2015 – 03/2017*
- Researched on technologies behind Digital Human and Immersive XR environments. The scope includes: 1. virtual Avatar creation 2. open world creation 3. Large language model with user feedback learning 4. environments fused into XR devices. Some key technologies include Unity engine with CV plugins, VSLAM, PBR/NRP rendering pipeline, Avatar performance driven deep learning models, and LLMs.

Qunar, Inc. **Beijing, China**
Senior Software Engineer *06/2014 – 11/2015*
- Headed the development of a new incubating project – matching vendors to user defined travel plans. Designed a distributed microservice architecture using Dubbo, Kafka, Redis, RabbitMQ, PostgreSQL, and more. Implemented

backend APIs on several core product features. Developed a comment microservice API, upgraded and optimized the order system for a 20% performance increase.

Jijia Information Technology **Beijing, China**
Software Engineer *01/2010 – 05/2014*

- Implemented a large-scale distributed backend system and Restful-APIs from scratch. Worked on multilayer Nginx load balancers, Java Spring microservices, logging center, Redis caching cluster, primary-standby SQL and NoSQL databases and more.
- Completed more than 150 backend APIs to serve requests from mobile clients, websites, and other internal services.

Personal Projects

Vulkan Rasterizer on Apple Silicon https://github.com/oceanzhang88/Vulkan-Rasterizer-Apple-Silicon

- This C++ Rasterizer incudes projective camera, shader loading and parsing, Vulkan pipeline components: Device, Swap Chain, Command Buffer, Descriptor, Push Constant, loading obj models, multi-point Lighting, alpha blending and more.

PyTorch/Processing/C++ Path Tracers https://github.com/oceanzhang88/3-Path-Tracers

- PyTorch Path Tracer aimed to enable solving the rendering equation with DL models. Recovered a diffuse BRDF so far.
- Processing Ray Tracer was adapted from a coursework taught by Prof. Greg Turk. Implemented kd-bvh, instancing, distribution ray tracing, and more. C++ Path Tracer extends the ray tracer and implemented Monte Carlo integration, GG-X Microfacet BSDF, VNDF importance sampling by Eric Heitz, photon mapping, and tone mapping.

A Concise NeRF-PyTorch Re-Implementation https://github.com/oceanzhang88/Another-NeRF-PyTorch

- Implemented a concise PyTorch version of original NeRF paper published in ECCV 2020. This project aimed to deliver highly readable code with correct result. All core modules included positional encoding, implicit representation, and volume rendering.

Technical Skills

Programming: C++/C#, Python, Shader (HLSL/GLSL) **Software/Library:** Unity, PyTorch, Vulkan, OpenCV
Deep Learning: Hands-on experience of the training-deployment pipeline. CNN, RNN/Attention/Transformer, Diffusion/GAN, RL.