Sunho Kim

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EDUCATION

University of California San Diego   La Jolla, CA
Bachelor of Science in Computer Science   *June 2025*

EXPERIENCE

Software Engineer Intern   May 2024 –
Apple   *San Jose, CA*
- Working on LLVM based GPU shader compiler as a part of development tools team

Contributor of LLVM Compiler Infrastructure   June 2022 – Sep 2023
Google Summer of Code   *Remote*
- Worked under guidance of compiler engineers from Apple and CERN to write linker backends for new Just-In-Time compiler infrastructure of LLVM
- Fixed major bugs in Julia programming language that prevented aarch64 linux to be in first tier support list
- Added re-optimization feature to JIT API that support runtime profile guided de-virtualization
- Presented the works at various technical conferences including LLVM dev mtg and ACM PLDI conference

Research And Development Contributor   June 2022 – Sep 2022
Princeton University   *Princeton, NJ*
- Worked with the compiler-research group at Princeton to develop LLVM's C++ interpreter
- Extended parser core of Clang C++ compiler to accept incremental source code

Software Engineer Intern   Dec 2022 – Mar 2023
Devsh Graphics Programming   *Warsaw, Poland*
- Worked on Vulkan ray-tracing renderer used by vendors in Europe to render 3D architecture scenes
- Implemented spherical rectangle sampling algorithms in GLSL to speed up benchmark scenes 5 times faster
- Implemented microfacet-based normal mapping that fixed light leak issue in path tracer setup

PROJECTS

GPUSpectral | *C++, Vulkan*   Jan 2021 – Jan 2022
- GPUSpectral is GPU accelerated path tracer built by using C++ and Vulkan ray tracing API
- Features low-level Vulkan abstraction written from scratch that support automatic barrier placement
- Implements all common BSDFs as well as plastic BSDF that accounts for inter-scattering within a thin Fresnel layer

Vita3K | *C++, Assembly, Python, OpenGL, QEMU, SPIR-V*   June 2020 – Sep 2022
- Vita3K is an open source Playstation Vita emulator developed in C++
- Worked on all parts of project as core maintainer, fixing bugs in kernel, CPU, and GPU emulations
- Implemented PowerVR bytecode to SPIR-V shader recompiler and aarch64 to x86_64 recompiler

AheuiJIT | *C++*   July 2021 – August 2021
- AheuiJIT is a JIT compiler for Aheui, esolang with 2D grid control flow that uses Korean characters
- Implemented various IR optimization passes such as mem2reg and constant folding
- Surpassed the performance of the previously fastest implemenation of Aheui by factor of 10

AWARDS

International Collegiate Programming Contest (ICPC): Top 10 in pacific northwest region advancing to national round
Samsung Collegiate Programming Contest (SCPC): Received 5th Place Award among 837 contestants
International Science and Engineer Fair (ISEF): Selected as Finalist to represent Korea in Software Category

TECHNICAL SKILLS

Languages: C/C++, LLVM IR, CUDA, GLSL, Python, Assembly
Libraries: LLVM, Vulkan, OpenGL, React, Node.js
Developer Tools: Git, Docker, IDA pro