David Zhao Akeley – Résumé

Majors	CS, Mathematics
GPA	3.762
Primary Email	dza724[at]gmail.com
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Select Engineering Courses	**Select Math Courses**
Parallel & Distributed Computing	Complex Analysis Honors
Advanced Computer Architecture	Algebra Honors
Machine Learning	Galois Theory
Formal Langauges & Automata	Mathematical Modeling

Professional Experience

Nvidia Corporation – October 2020 - Present – Developer Technology Engineer

1. Collaborated with Nvidia Research on GPU algorithms for SDF-based[1] 2D computational geometry. "How to Accelerate 2D Shape Processing for Manufacturing and Planning" - GTC 2023 (s51140)
2. Wrote Vulkan samples for `VK_EXT_graphics_pipeline_library`, `VK_KHR_timeline_semaphore`, `GL_KHR_shader_subgroup_shuffle`, `VK_NV_inherited_viewport_scissor`, and ray tracing extensions.
3. Designed `VK_NV_inherited_viewport_scissor` and implemented its driver and toolchain support.
4. Consulted with business partners on integrating Nvidia technology: DMM, `GL_NV_path_rendering`.

Sholari LLC – July - September 2019 – Contractor

1. Worked on a tumor growth and treatment simulator written with the Unity game engine.
2. Implemented tools for visualizing tumor responses to treatments: line graphs, waterfall (bar) plots, and the user interface for the timeline (graph x-axis).
3. Wrote a multithreaded `C++11` plugin for visualizing tumors & immune system responses as particle clouds, and integrated it with the single-threaded `C#` Unity Engine.

Stanford University – June - September 2018 – Undergraduate Research Assistant

1. Helped prototype Aetherling, a Haskell-embedded domain-specific language for designing hardware image processing pipelines with automatic parallelization and static scheduling; co-authored paper with David Durst (lead author), Dr. Kayvon Fatahalian, and Dr. Pat Hanrahan.
2. Implemented a functional simulator of an early prototype of Aetherling.
3. Revised the type system to remove impediments to parallelizing line buffers.

`https://aetherling.org` ("Type-Directed Scheduling of Streaming Accelerators" - PLDI 2020)

Unpaid Internships & Projects

MediocrePy – March - June 2017 – Independent Project – `https://github.com/akeley98/MediocrePy`
AVX-accelerated statistical image combine (averaging) Python module for astrophysics

Tsinghua University – July - August 2016 – Summer Intern
Microlensing event light curve fitting with Python, `C++`, SciPy, and Matplotlib

Jide Technology Co. – June - July 2015 – Summer Intern
Product testing and English documentation/marketing for RemixOS

WebGL Jelly Cube Project – `https://youtu.be/YwvMSeB6NzU`
Reflection and refraction web demo; UCLA Fall 2017 computer graphics class third place winner[2]

Myricube – Vulkan Voxel Renderer – `https://github.com/akeley98/myricube`
Experiments with hybrid raycasting/rasterization voxel rendering, with low-latency model updates

Proposed gem5 Partial Bypassing Patch – `https://gem5-review.googlesource.com/c/public/gem5/+/27767`
Refactored `C++11` code from my Advanced Computer Architecture course project

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Fonts: Computer Modern, FreeSans (GNU FreeFont), `Ubuntu Mono` (Dalton Maag & Canonical Ltd.)
Full CV – `https://github.com/akeley98/resum-/blob/master/cv.pdf`

[1] Signed Distance Field
[2] `https://www.facebook.com/vasilescu.alex/posts/10155206917936588`