

Arjun Krishnan

Software engineer specializing in graphics and video game programming

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Work Experience

Sony Interactive Entertainment: PlayStation - Software Engineering Intern Summer 2025

- Implemented quality-of-life features into a cross-platform, multiplayer game built in **Unreal Engine 5**.
 - Engineered a lightweight solution for navigating dynamic UI menus in all game modes.
- Developed a proof-of-concept Match-3 mobile game to increase user engagement in the PlayStation App.
 - Designed, prototyped, and polished the game using **Godot**. Built a particle state machine, a state persistence manager, and a tutorial card framework.
 - Incorporated official Astro Bot assets sourced from designers on the mobile development team.
 - Integrated the game into the PlayStation App as a landing screen tile using **React Native** and **JavaScript**.
- Explored graphics programming with the **PS5 SDK**. Wrote a custom domain warping shader and a .OBJ file loader to render on PS5 devkit. Optimized the loader to minimize memory footprint.

Projects

Hyacinth Game Engine & Server - C++, Vulkan, PhysX January 2026 - Current

Deferred-rendered, multiplayer first-person shooter game engine and server.

- Engineered a multithreaded **authoritative game server** to connect game clients. Features a 128 hertz tickrate, client prediction / server reconciliation, and lag compensation.
- Developed a **volume-based Dynamic Diffuse Global Illumination (DDGI)** system using ray tracing to calculate indirect illumination. Optimized with a stencil buffer to ensure one evaluation per pixel.
- Implemented PBR materials, cascaded shadow mapping, compute skinning, FXAA, locomotion, and a UI system that supports elements in world space.
- Utilized frame analysis tools such as **RenderDoc** and **NVIDIA Nsight** to locate bottlenecks. Reduced frame time from **8.1 ms/frame** to **6.15 ms/frame (32%)** through compute frustum culling and a depth prepass.

Stingray Raytracer - C++, CUDA June 2023 - September 2023

Realtime ray tracing application, accelerated on the GPU using Nvidia's CUDA API.

- Incorporated iterative anti-aliasing, physically-based materials with variable parameters, and direct light sampling for specular lights and soft shadows.
- Optimized frame time from **350 ms** to **15 ms (~23x speedup)** by implementing **Bounding Volume Hierarchies** and parallelizing ray calculations on the GPU.

Extrusion - Unreal Engine 5 August 2024

- GMTK Game Jam, 12 person team; Developed an interactable object system and post-processing effects - animated vignette, pixelation, and edge detection. Designed puzzles and assembled rooms for the main level.

Bow and Arrow Simulator - Unreal Engine 4 August 2021

- Created a first-person bow and arrow simulation, featuring collision logic for arrows, an animated bowstring, a state machine for the player, particle systems, and a target-shooting minigame.

Dillo's Bounce - Unreal Engine 5 July 2023

- Major Jam 6, 5 person team; Implemented physics-based rollerball movement using angular impulses. Extended this system for pinball bumper mechanics. Designed and animated the main menu and final level.

Education

University of California: Santa Cruz September 2022 - December 2025

Bachelor of Science in Computer Science: Game Design, Minor in Computer Science, GPA: 3.97

Technical Skills

Languages/Tools: C++, C, Python, Unreal Engine 4 / 5, Vulkan, CUDA, Git, Jenkins, Unity, Nvidia Nsight