Andrew Knowles

(631) 316-0130 • ajknowles21@gmail.com • ajknowles11.github.io

EDUCATION

B.S., Mathematical Sciences (Discrete Mathematics and Logic) Graduated May 2024

Carnegie Mellon University, Pittsburgh, PA

Minor in Game Design

Relevant coursework: Computer Game Programming, Computer Graphics, Intro to Computer Systems, Linear Algebra, Data Structures and Algorithms, Principals of Functional Programming, Advanced Game Studio

TECHNICAL SKILLS

Programming: C, C++, C#, Java, Python; OpenGL, Vulkan **Game Engines:** Unreal, Unity, Godot

Mathematics: Discrete Math, Linear Algebra, Multidimensional Calculus

WORK EXPERIENCE

Gameplay Systems Engineer Intern April 2025 - August 2025

Epic Games (Fortnite)

- Shipped code via live-service updates to millions of players across multiple platforms on Fortnite's Cosmetic Tech team
- Provided core engineering support for a future cosmetics feature, creating systems for new content and integrating into existing cosmetics flows such as item previews to prioritize a complete and polished user experience
- Navigated and contributed to a large codebase with rigorous code standards, communicating with different teams/disciplines and interfacing with their systems in C++ and Blueprints (notably UI, tech design, tech art, animation programming)
- Wrote documentation for engineering work; directly assisted and advised technical designers and artists using new features
- Collaborated closely with fully remote team of ~20, maintaining active communication across U.S., Europe via Slack, Zoom

Mixed Reality Research Assistant June 2023 - December 2023

Embodied Computations Lab, Carnegie Mellon School of Design

- Developed custom application for in situ welding training and guidance in Unity, C# for use with Meta Quest Pro, Quest 3
- Collaborated with Design graduate students to design and construct custom welding helmets with VR headset mounts
- Created shaders to implement UI assets for overlay visuals, targeting adaptability and compatibility with Quest Passthrough
- Conducted workshops with on-site demos for local industrial design students, incorporating feedback in new iterations

PROJECT EXPERIENCE

3D Graphics Engineer Spring 2023, Spring 2024

CMU 15-462, 15-472 Computer Graphics

- Implemented algorithms in rasterization and raytracing pipelines in CMU's educational graphics package using C++
- Programmed basic mesh editing, skeletal animations via forward and inverse kinematics, particle physics simulations
- Prototyped Vulkan scene viewer in C++ using custom vector math library and Win32 API for new real-time graphics course

C++ Programmer, Graphics Programmer (OpenGL), Game Designer Fall 2023

CMU 15-466 Computer Game Programming

- Built 6 small games on a weekly basis, 1 large game in 2 months; rapidly prototyped gameplay, graphics using C++, OpenGL
- Developed custom asset pipelines, Blender add-ons in Python; facilitated level iteration and scripting for interactables
- Programmed custom 3D physics engine supporting sphere and box collisions in mini-golf game
- Designed and implemented custom recursive stencil buffer-based portal system for non-Euclidean puzzle game

Unity Game Programmer, Game Designer June 2023 - March 2024

Independent Work

- Created unique camera-based puzzle game for Ludum Dare 54, placing 72nd overall, 16th in innovation category (solo)
- Collaborated with 10+ teammates (hybrid) for puzzle narrative for GMTK Jam 2023; built dialogue and progression systems
- Co-designed mixed reality experience for Quest 3 with fellow student for independent study; programmed FPS mechanics

Unreal Game Developer, Lead Programmer August 2022 - March 2024

CMU Game Creation Society

- Developed vertical slice for linear, narrative-based first-person shooter game using Unreal Engine, Blueprints and C++
- Led team of 15 students to develop online multiplayer horde shooter; designed systems, taught Unreal to new programmers
- Programmed gameplay mechanics (hitscan weapons) and enemy AI; implemented dynamic first and third-person animations