Andrew Knowles

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EDUCATION

B.S., Mathematical Sciences, Discrete Math and Logic Concentration Graduating May 2024
Carnegie Mellon University, Pittsburgh, PA
Minor in Game Design

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

TECHNICAL SKILLS

Programming: C, C++ (Unreal), C# (Unity), Java, Python **Game Engines:** Unreal, Unity, Godot
Mathematics: Discrete Math, Linear Algebra, Multidimensional Calculus
Additional Experience: 3D Modeling (Blender), Web Dev (HTML, CSS), Video Editing (Davinci Resolve)

AR/VR DEVELOPMENT

Mixed Reality Research Assistant June 2023 - August 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
- Collaborated with Design graduate students to design and construct custom welding helmet with Quest Pro mount
- Wrote custom shaders to integrate UI assets for overlay visuals, enabling fast iteration on designs via parameters
- Reverse-engineered and modified Java plugin to collect additional sensor data through headset USB-C port
- Conducted workshops with on-site demos for local industrial design students, listening to feedback

Android AR Software Developer January 2023 - May 2023
CMU 53-472 Advanced Game Studio

- Developed "Cyber Sleuth", a geospatial AR game for Android with Niantic's Lightship ARDK using Unity and C#
- Utilized Lightship Visual Positioning System to place characters and objects in real-world locations at CMU
- Prototyped tool for designers to place story and background objects via AR for use in editor
- Designed flexible dialogue and progression system for story-driven gameplay

Virtual Reality Game Developer January 2023 - May 2023
CMU Game Creation Society

- Developed "Project Horus", a VR boss-fighting game with sword-based combat using Unreal Engine, Blueprints
- Designed and implemented enemy AI, integrated with directional VR combat system
- Collaborated with animators to design and implement custom enemy attacks

OTHER SOFTWARE DEVELOPMENT

3D Graphics Engineer January 2023 - May 2023
CMU 15-462 Computer Graphics

- Completed algorithms in rasterization and raytracing pipelines in CMU's educational graphics package using C++
- Implemented local and global mesh geometry operations with low time complexity
- Programmed algorithms for skeletal animations, via forward and inverse kinematics

Lead Programmer, Unreal Game Developer August 2022 - December 2022
CMU Game Creation Society

- Developed "Panarctica", a linear first-person shooter game on frozen airships using Unreal Engine, Blueprints and C++
- Programmed full and semi-automatic hitscan weapons, with animations for firing and reloading
- Designed and programmed enemy AI for detecting player, moving, and firing weapons
- Developed custom recoil system for weapons with automatic camera adjustment

Unity Systems Programmer, Technical Narrative Designer June 2023
GMTK Jam 2023

- Developed "Hames Blond", 3D first-person puzzle narrative for 48-hour game jam using Unity, C#, WebGL
- Expanded on previous dialogue and progression system, adding support for voice clips, subtitles, and character portraits
- Designed puzzles, integrated with progression system to unlock throughout gameplay