# Anthony B. Bartholomew

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## EDUCATION

Ohio State University, Columbus, OH GPA (4.0 scale): 3.58
B. S. in Computer Science and Engineering, December 2019

## SKILLS

- **Languages**: C/C++, C#, GLSL, Java, JavaScript, HTML, CSS, Assembly, Lua, Python
- **Rendering APIs**: OpenGL, WebGL2
- **Game Engines**: Unity, MonoGame
- **Frameworks**: CppUTest, Junit, Unittest, Aframe, three.js, Spring
- **Development Tools**: GitHub, Bitbucket, Team Foundation Server, Confluence, Jira, Visual Studios
- **Coursework**: Data Structures & Algorithms, Embedded Systems, Computer Graphics, Game Development, Computer Networking, Databases, Computer Architecture

## PROFESSIONAL EXPERIENCE

**JPMorgan Chase & Co.**, Columbus, OH February 2020 – Present
**Full Stack Developer**

As a Full Stack Developer, I worked on the Digital Account Opening and Business Lending product lines under the Community & Consumer Banking sector. Focused on building out features necessary for allowing thousands of businesses to apply for Paycheck Protection Program loans.

- Utilized Spring for Apache Kafka to create event-driven micro-services.
- Leveraged BlueJS, a proprietary front-end framework, to develop customer facing webpages.
- Developed REST controllers to allow webpages to communicate with back-end services.
- Performed data modeling using Apache Cassandra databases.

**Ohio State University**, Columbus, OH March – May 2018, September – December 2019
**3D Virtual Reality Environment Programmer**

Conducted research at the Advanced Computing Center for Arts and Design department to recreate medical professionals' offices in virtual reality using 360° photos and 3D modeling software. Tasked with developing virtual systems that could be applied to 3D assets to mimic real-world medical technology.

- Developed a virtual camera system using three.js and Aframe that allows users to take screenshots and videos from secondary cameras in the scene to emulate medical imaging equipment.
- Took advantage of render texture targets to create a camera feed system where a planar piece of geometry displays back to the user what the virtual camera is rendering.
- Designed a backend Node.js server that enabled image data received from users to be saved to persistent local storage as either a screenshot or video.

**General Electric Appliances**, Louisville, KY August – December 2017, May – August 2018
**Embedded Firmware Co-op**

Developed firmware on the refrigeration and air conditioning product lines for one of the industry's leading manufacturer of in-home appliances.

- Employed Test-Driven Development software practices to produce high-quality code.
- Designed open-loop ramping algorithms for internal cooling fans and user interface LED's.
- Updated service diagnostics tools for all air conditioning products to provide a standard troubleshooting interface for technicians in the field.
- Deployed factory diagnostics tool that allowed workers on the line to ensure that new refrigeration mainboards were properly flashed.

## ENGINEERING PROJECTS

**Dungeons of Avarice** (https://polygoners.itch.io/dungeons-of-avarice)

- Led senior capstone game development team in creating a procedurally generated dungeon-crawling roguelike using the Unity game engine.
- Engineered tiling algorithm for dungeon generation to create an endlessly repayable experience.
- Utilized Unity Store assets to design immersive environments and dungeons.
- Implemented Voronoi split screen and multiple input handling to support cooperative play.
- Provided diverse gameplay by incorporating 60+ weapons, 9 unique magical abilities, 70+ playable character models, and 15+ challenging enemy types.
- Developed a robust player animation system with 180+ animations.
- Distributed DVD cases with custom box art and download link insert during capstone showcase to people who came to play the game.
- Achieved awards for *Most Polished Game* and *Best Overall Game* out of 4 teams in the class.
- Attained the *Best in Class* award from the Computer Science and Engineering Department for the Capstone Project Competition.

**Portal Mario Game** (https://github.com/Abar23/Portal-Mario)

- Using Agile software methodologies, created an interactive 2D side-scrolling Mario game with a team of 3 other students using the MonoGame game engine.
- Implemented the Portal Gun and relevant physics as seen in the game Portal.
- Achieved the best game in the class out of 5 teams.

**OpenGL Rendering Coursework** (https://github.com/Abar23/Real-Time-Rendering-Coursework)

- Implemented a primitive shape library to render geometry such as cubes, cones, and cylinders.
- Utilized the L-System algorithm to generate 3D plants procedurally.
- Modified OpenGL viewport to render in a stereoscopic view as seen in virtual reality applications.
- Utilized fragment shaders, texture units, and 2D samplers to texture 3D geometry.
- Achieved understanding of the graphics rendering pipeline and modern OpenGL programming.

**Fractal Raymarcher** (https://github.com/Abar23/WebGL-Ray-Marcher)

- Implemented a raymarching fragment shader using the WebGL rendering pipeline.
- Utilized a fractal distance estimator to render a parameterized 3D Mandelbulb.
- Achieved goal of rendering a 3D Mandelbulb fractal in real-time.

**Boids Birds** (https://github.com/Abar23/Boids-Birds)

- Developed an interactive web-based virtual reality application using WebGL2 and WebVR that simulates the flocking behavior of birds by implementing the Boids algorithm.
- Created a sprite-based animation system to utilize assets from the game Duck Hunt.
- Achieved goal of replicating realistic flocking behavior found in nature.