matthew.brown@virginia.edu
(757) 769-4993

github.com/Mushakushi
www.mushakushi.com

Matthew Brown

Education

University of Virginia | Bachelor's in Computer Science — **Expected Graduation May 2026**
- Software Game Development Club, Cracking the Interview Club

Projects

Third-Person Arcade Platformer | "Alter Aria" — **Unreal Engine, C++, Blueprint**
- Developed a dynamic, responsive AI system for a 3D platforming character, utilizing C++, Blueprint, Behavior Trees, and Navigation meshes.
- Enhanced life-like character animations using the Animation Blueprint and Control rig computing poses and IK with quaternions and vectors.
- Addressed performance concerns using Nanite and Lumen, while ensuring high-quality visuals.

Boxing Game | "Super Battle Machine Boxing" — **Unity, C#, HLSL**
- Wrote GLSL shaders using a modern graphics pipeline, ensuring performance and compatibility with major gaming platforms, to create gameplay effects and transitions, winning 2nd place in regional competition.
- Added a controller agnostic multiplayer input layer, game save system along, and the base game architecture to manage accurate collisions, menus, audio, and the game state.

Co-Op Third-Person Puzzle Game | "Puzzles with Me & You" — **Unity, C#, HLSL**
- Engineered a Spline traversal framework using Bezier curve mathematics in Unity, creating custom editors for development that aided in flexible puzzle designing, qualifying for a national level competition.
- Created a Unity UI XML framework to facilitate the rapid development of extensible, context-aware menus, which was additionally published online.

Platformer Pathfinding Library — **Unity, C#**
- Applied advanced principles of linear algebra to design and implement custom physics simulations using kinematic rigid bodies within the Unity engine, ensuring accurate and realistic movement behaviors for game characters and objects.
- Implemented the A-Star pathfinding algorithm for Unity to allow deterministic AI movement using the bult-in and custom physics simulations, publishing the documentation online.

Personal Portfolio — **NextJS, Docker, SQLite, AWS Amplify, TypeScript, CSS**
- Designed a NextJS frontend and backend with a stream-lined graphical interface and short loading times, highlighting features and contemplations about gameplay programming in various engines and languages.
- Leveraged Docker and a RESTful SQLite backend API to easily store and modify site content, removing the need to directly modify source code.

Work Experience

Software Developer | C#, Python, SQL (MongoDB, PostgreSQL), HTML, TypeScript, AWS — **Aug. 2022 — Present**
DOMA Technologies
- Developed a full-stack document indexing tool leveraging computer vision and machine learning to convert client physical records to digital, reducing the necessary processing time by over two hours per 1,000 documents.
- Led the development of administrative and database management tools, using React and Node while leveraging SSR and material design to streamline content for end users, minimizing load times, improving search, and providing security.
- Refactored the codebase of a proprietary web application from JavaScript to TypeScript, adding documentation and type safety to eliminate all frontend type errors over 500 files.

Technical Skills

Languages: C++, C#, Java, HLSL, JavaScript, TypeScript
Frameworks: Unreal, Unity, React, Node.JS,
Tools: AWS, Docker, React, NextJS, Bootstrap, jQuery, NodeJS, Tesseract