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Matthew Brown

Education

University of Virginia, Bachelor's in Computer Science **Expected Graduation May 2027**

- **Extracurriculars:** Software Game Development Club, Cracking the Interview Club
- **Coursework:** Computer Systems Organization, Data Structures and Algorithms, Discrete Mathematics

Work Experience

Game Director, UVA Software Game Developers, "Zombie Crossing" | Unity, C#, HLSL **Jan. 2024 — Dec. 2024**

- Led the development of a video game project from concept to launch, overseeing cross-functional teams and driving innovation through agile methodologies.
- Wrote GLSL shaders using a modern graphics pipeline, ensuring performance and compatibility with major gaming platforms, to create gameplay effects and transitions.
- Added a controller agnostic multiplayer input layer using the New Input System, game save system, and the base game architecture to manage accurate collisions, menus, audio, and the game state with appropriate automated tests to ensure functionality.

Game Developer, UVA Physics Department "Gravitational Wave Surfer" | Unity, C#, HLSL **Jun. 2024 — Present**

- Developed a 3D physics simulation about black holes that involved simulating black holes, curved spacetime, and gravitational waves.
- Implemented realistic physics simulations using HLSL shaders to visually represent gravitational wave propagation. Collaborated with physics professors and graduate students to ensure the scientific accuracy of black hole simulations.
- Designed and integrated an interactive user interface for students to explore different black hole configurations and spacetime curvature effects in a real-time visualization.

Software Developer, DOMA Technologies | C#, Python, MongoDB, PostgreSQL, HTML, TypeScript, AWS **Aug. 2022 — Present**

- Developed a Python full-stack document indexing tool leveraging computer vision and machine learning to automate the conversion of client physical records to digital, reducing the necessary processing time by over two hours per 1,000 documents.
- Developed 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 on SQL databases, and providing security on AWS infrastructure.

Projects

UI Toolkit Menu Framework | Unity, C# **github.com/mushakushi/ui-toolkit-menu-framework**

- Designed and implemented menu extensions that enabled dynamic UI behavior, including input handling, automatic focus management, and global settings, leading to improved user experience and customization across projects.
- Utilized Unity's Input System to integrate responsive and context-aware menu navigation, enhancing player interaction and reducing menu-related bugs, optimizing the framework for reusability through scriptable objects and UXML document references.

Yarn Spinner Utility | Unity, C# **github.com/mushakushi/yarn-spinner-utility**

- Developed a custom Yarn Spinner integration that enabled seamless branching dialogue in Unity, offering a more flexible and decoupled solution than the default Unity integration, enhancing developer control over dialogue flow, especially by porting over the code to the new Awaitables system and utilization of observers.

Personal Portfolio Website | NextJS, Docker, SQLite, AWS Amplify, TypeScript, CSS **mushakushi.com**

- Designed a NextJS frontend and backend with a stream-lined graphical interface and short loading times, highlighting features and contemplations about gameplay programming and development 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.
- Designed a scalable and secure cloud infrastructure on AWS Amplify, ensuring high availability and reliability for critical applications, while implementing cost-effective strategies through serverless computing code optimization.

Technical Skills

Languages: HTML5, JavaScript, TypeScript, CSS, C++, C#, Java, HLSL, SQL
Frameworks: .NET, React, Node.JS, NextJS, Unreal, Unity
Tools: AWS, Docker, React, Bootstrap, jQuery, NodeJS, Git