

Jay Blankenship

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Jayblankenship@outlook.com

Professional Summary

Innovative software engineer with a Master's in Machine Learning and Artificial Intelligence and over two years of professional experience building high-performance AI-driven systems. Expert in C++, Python, and neural network implementation. Skilled in reinforcement learning, algorithm optimization, and solving complex technical challenges.

Technical Skills

- **Programming Languages:** C++, Python, C#, Java, SQL, Perl, Javascript, HTML, css/xml, F#, PHP, Kotlin,
- **AI/ML Technologies:** Neural Networks, Reinforcement Learning, Q-Learning, Markov Decision Processes, TensorFlow, PyTorch
- **Development:** Unreal Engine 5 (5.2–5.5), Scripting, AI/NeuralNetworks, Procedural Content Generation, Neural Network integration, Mobile Development, Shell scripting, Linux, Databases
- **Tools & Platforms:** Visual Studio, Git, Perforce, Linux, AWS, Docker, Google Analytics 4
- **Technologies:** Multithreading, Network Programming, Shader Development, 3D Math, Data Pipeline Automation
- **Specialized Skills: Hardware/Software-Conscious Optimization, GPU Acceleration, Low-level Memory Management, Parallel & Multi-threaded Algorithms :** Applied low-level optimization in C++ and WASM to achieve sub-millisecond latency in performance-critical systems.
- **Methodologies:** Agile (Scrum/Kanban), Code Reviews, Debugging, Performance Optimization

Lead Software Engineer, TBX Umbrella | *Solution Architect & TBX Developer* | 7/2025 – Present

Spearhead software strategy and execution as **Lead Software Engineer** across **all affiliated entities** under the TBX corporate umbrella, unifying architecture, development, and delivery for TBX Solutions, TBX Innovations, and every subsidiary operation. Deliver adaptive, high-velocity systems that scale to any client-defined constraint—functional, technical, or operational—without boundary.

- Architected a High-Performance Car Platform (tbxautogroup.com): Engineered a fully static, dealer-managed JAMstack site that delivers a dynamic, app-like experience. Achieved exceptional performance (93) with elite Core Web Vitals—0ms Total Blocking Time and 0 Cumulative Layout Shift—alongside near-perfect scores in Accessibility (96) and SEO (91), proving a cost-effective static architecture can rival complex dynamic platforms.
- Built a Production-Grade TMS (shipwithtbx.com) from Scratch: Single-handedly developed a full Transportation Management System using React, Node.js, and Supabase. Core features include live GPS tracking, dynamic route optimization, and automated documentation.
- Drove Down Costs with Modern Architecture: Leveraged serverless and static-first principles to reduce hosting costs by 87% versus traditional deployments, while gaining enterprise-grade security and scalability with minimal operational overhead.
- Instituted Robust Engineering Practices: Established a high-quality software delivery lifecycle using Domain-Driven Design, Git-centric workflows, and zero-downtime releases, enabling rapid development of custom client solutions without technical debt.

Local Automotive Shop (Contractor) | *Solution Architect & Integrations Expert* | 9/2024 – 7/2025

- Built revenue and profit reporting dashboards using SQL and custom scripts.
- Integrated shop management software with a web-based scheduling platform via REST APIs.
- Configured and analyzed Google Analytics for the shop's website to optimize customer engagement.
- Trained owner and staff on digital process automation and workflow efficiency.

Professional Experience | Centuria (Contractor for National Oceanic and Atmospheric Administration)

Scientific Applications Programmer / Database Administrator (Security Clearance)

Stennis Space Center, MS | 8/2022 – 8/2024

- Engineered a high-performance file retrieval system in C++ and Java, transitioning from FTP to HTTPS, reducing bandwidth usage with optimized hashmap-based algorithms.

<https://jayblankenship.github.io/>

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- Automated large-scale data pipelines using Python and SQL, integrating netCDF datasets into databases, cutting processing time and ensuring data integrity for HFRadar archives.
- Optimized real-time system performance with multithreaded C++ modules and enhanced Linux cron jobs, increasing update frequency for mission-critical applications.
- Debugged complex system integration issues in C++, resolving asciild errors, correcting and improving data processing efficiency.
- Led migration of four websites to Google Analytics 4, improving user engagement metrics through seamless data tracking.

Initial Work Experience | Walmart : Sales Associate and Automotive Technician | 7/2015 – 8/2022

College AI and Game Development Senior Projects

3D Snake Game with Neural Networks

Unreal Engine 5.2, C++ | Published on itch.io: <https://jayblankenship.itch.io/snake3d> | 2023

- Developed and published a 3D Snake game featuring neural network-controlled NPC snakes, achieving an excessively high win rate that increases as time goes on in simulated environments using Q-Learning and Neural Network implementations.
- Optimized reinforcement learning algorithms, reducing computation time through efficient data structures, parsing and tokenization.
- Integrated real-time performance monitoring, enhancing gameplay responsiveness.

Open-World Multiplayer Networked Survival Game

Unreal Engine 5.2, C++, Blueprint, SQL | 2023 – 2024

- Designed AI-driven gameplay mechanics and character behaviors in C++ and Unreal Engine 5.2, reducing input latency through code optimization.
- Implemented networked multiplayer features with a SQL-backed database and Kotlin API, achieving reliable real-time data synchronization.
- Optimized build configurations and resolved preprocessor macro errors, enabling Live Coding and reducing iteration time.

WebGL/OpenGL 3D Graphics Demo

WebGL, OpenGL, JavaScript | 2022

- Created interactive 3D rendering applications with Phong and Gouraud shading, optimizing shaders to improve frame rates.
- Implemented camera movement and hierarchical transformations, enhancing rendering efficiency and user interaction.

Education

M.S., Machine Learning and Artificial Intelligence

University of Illinois at Chicago, College of Engineering | 7/2023 – 12/2024

Relevant Coursework: Deep Learning, Reinforcement Learning, Large Language Models

B.S., Computer Science

University of Illinois at Chicago, College of Engineering | 5/2017 – 12/2021

Relevant Coursework: Algorithms, 3D Graphics Programming, Data Structures

Prerequisites : Elgin Community College

Additional Achievements

- Published AI-driven 3D Snake game on itch.io (<https://jayblankenship.itch.io/snake3d>), showcasing neural network implementation for NPC behavior.
- Developed an optimized Unreal Engine 5.2 project, leveraging Live Coding tools to streamline Networked InventorySystem code development, achieving a reduction in iteration time and establishing a robust system architecture for the inventory.
- Automated National Oceanic and Atmospheric Administration data workflows, saving hours annually in manual processing.

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