Christopher Trumpet Jr.

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Education

Purdue University (Expected Graduation) May 2026
Bachelor of Science in Computer Science

Work Experience

Software Developer, Rosen Center for Advanced Computing Sep 2023 – Present
Developed and deployed novel solutions that integrate computer graphics, VR, and web applications,
currently being used to support research and enhance education in real classroom settings

- **Internal Documentation Site with Custom CI/CD tooling** | *React, C# / .NET, Git, Python, GitHub Actions*
  - Built custom Docusaurus documentation platform for ~30 person department to centralize knowledge and support a workforce of rotating part-time student members.
  - Developed specialized tooling and automation pipelines to extract and aggregate API comments and project documentation from diverse sources, translating content to a common Markdown format and distributing it to the central site.
  - Implemented an essential onboarding/offboarding solution that accelerates developer ramp-up and maintains organizational knowledge for projects frequently rotating in and out of active development, directly addressing a core departmental need.

- **Virtual Biosafety & Microbial Analysis Lab** | *C#, Unity 3D, Git, Blender 3D, Substance Painter*
  - Engineered a robust simulation system utilizing finite state machines for deterministic logic flow and the Factory Pattern to streamline dynamic data generation, managing full-cycle development using Git and GitHub Actions.
  - Facilitated client meetings to translate requirements into technical specifications, leveraging these design patterns to deliver a scalable web application while leading a three-member team.

- **Networked Virtual-Reality Nursing Simulator** | *C#, Unity 3D, Git, Photon Network, Unity 3D, Blender, Ink*
  - Engineered a multi-user virtual reality training simulation using Unity and Blender, providing a realistic, synchronized environment for nursing class clinical skill practice within Meta Quest headsets.
  - Improved experiences working with a networked, real-time system, and interdisciplinary teamwork through bi-weekly meetings, program revisions, and paired programming.

Projects

- **Automated Phishing Campaign (Catapult Hackathon)** | *Python, SQL, React* Apr 2025
  - Launched phishing campaigns through algorithmically selecting targets, and automatically composing attacks and a report on findings with Python CLI and ElevenLabs API.
  - Performed employee threat scoring from CSV/DB ingestion and generated customized Markdown/PDF debriefs and reports.

- **Custom HTTP Server** | *C++, HTML* Apr 2025
  - Engineered a custom HTTP server in C++ utilizing the socket API to manage network communication.
  - Implemented core TCP/IP functionalities (socket creation, binding, listening) to process basic HTTP GET requests, including parsing raw headers and dynamically formulating valid responses for static content.

- **Memory Allocator (Malloc Replica)** | *C, Make* Feb 2025
  - Managed dynamic memory allocation using a coalescing free list data structure to efficiently track and reuse freed memory blocks, mitigating external fragmentation.
  - Successfully benchmarked the custom allocator against standard glibc malloc(), showing comparable performance.

- **Custom Dynamic Interpreter** | *Java, C, Make* Oct 2024
  - Developed a dynamically typed programming language featuring a hand-written scanner, a single-pass compiler, and a custom stack-based bytecode virtual machine for high-performance execution.
  - Implemented a mark-and-sweep garbage collector to handle manual memory management, optimizing runtime efficiency through string interning and nan-boxing/pointer tagging.

- **Linux Shell** | *Lex, Yacc, C++, Make* Mar 2024
  - Developed a linux command-line shell in C, implementing robust command parsing, execution, and I/O redirection.
  - Implemented inter-process communication using pipes (|) to chain commands, managed child processes with fork() and execvp(), and ensured resource cleanup with waitpid().

Technical Skills

Languages: C, C++, C#, Java, JavaScript/Typescript, SQL, HTML/CSS, Bash Scripting, Python
Frameworks & Tools: React, Unity 3D, GitHub Actions, Git, JUnit, NodeJS, GDB, Ropper, Qt, Make
Design: Blender3D, Figma, Adobe Photoshop, Adobe After Effects
Additional: Microsoft Excel, AWS, Linux (Ubuntu, Arch), Asana