Julia Connelly

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Skills

Languages: C++, Python, Java, Matlab
Developer Tools: Git, Docker, VS Code, CMake, Jenkins
Frameworks: Unix, OpenAPI, REST, SYCL/oneAPI, ONNX Runtime

Work Experience

GE HealthCare – MR Image Reconstruction Milwaukee, WI

Senior Software Engineer *Oct 2024 – Present*

- Architected and implemented a high-performance C++ server that bridged modern REST APIs with legacy firmware interfaces for cardiac and respiratory gated MR scanning, enabling seamless integration of new capabilities without firmware replacement.
- Led troubleshooting of a complex distributed medical imaging system spanning microservices, legacy components, and asynchronous communication pathways across multiple compute nodes, identifying and resolving critical issues throughout feature development.
- Designed and implemented a high-throughput asynchronous archiving service in C++ that concurrently processes multiple MR data streams, making critical data available to algorithm developers and researchers without degrading system performance.
- Established collaborative knowledge sharing by mentoring senior team members in modern software engineering practices, focusing on modular, maintainable, and testable software architecture, test-driven development, and C++ best practices.
- Co-led adoption of Gitlab for comprehensive project management, including feature tracking, sprint planning, and documentation, improving project traceability and visibility.

Orchestra Platform Specialist – Bubble Assignment with Women's Health in France *Mar 2024 – Oct 2024*

- Led international knowledge transfer and accelerated adoption of MR's proprietary image processing pipeline platform (Orchestra) within the Women's Health team in France by conducting hands-on training, pair programming sessions, and code reviews that significantly reduced integration time for a team of 5+ engineers.
- Spearheaded integration of GPU-accelerated algorithms using SYCL/oneAPI and AI inference with ONNX Runtime into an Orchestra processing pipeline, pioneering a novel technology combination that delivered higher quality images within timing specifications.
- Engineered a sophisticated test framework that systematically isolated non-deterministic behaviors in complex algorithm chains, enabling the team to resolve critical race conditions that had previously caused intermittent image quality defects.
- Architected resource management gating mechanisms within the Orchestra pipeline that prevented GPU memory oversubscription, enabling reliable execution of memory-intensive algorithms on limited hardware resources.
- Modernized the build system by implementing CMake and container-based dependency management, reducing environment setup time and enabling faster development through VS Code with Docker integration.

Software Engineer *June 2020 - Mar 2024*

- Architected and maintained C++-backed Matlab and Python APIs for retrieving critical MR scan data, serving as the project owner, resulting in a reduction in feature integration time and improved user experience.
- Delivered critical legacy clinical applications to the next-generation MR platform by reverse engineering complex code bases and reimplementing core functionality within a modern microservices architecture, enabling seamless transition for clinicians while improving system maintainability and user experience.

Edison Engineering Development Program *June 2018 - June 2020*

- Led accelerated development of a C++-backed Python SDK for MR algorithm researchers, achieving a critical delivery timeline for the ISMRM 2019 conference that enabled immediate adoption by the GEHC research community.

Education

Johns Hopkins University Baltimore, MD

Master of Science in Computer Science *May 2019 – Dec 2021*

Carleton College Northfield, MN

Bachelor of Arts in Computer Science *Sept 2014 – June 2018*