

ROBERT EDWARD FRY

✉ inbox@robertfry.xyz

☎ +44 7982 300669

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4 years professionally experienced software engineer with a Master of Mathematics (**MMath, Distinction**) from the University of Portsmouth. • Able to design, implement, and test solutions to meet requirements and specifications. • Able to explain technical details to customers, clients, and stakeholders of all backgrounds. • Able to interpret and solve difficult mathematical problems.

Technical Competencies

• Rust • C++ (ISO/IEC 14882) • C (ISO/IEC 9899) • CMake • UML (ISO/IEC 19501) • Python • GNU/Linux • Bash • Git • Docker

PROFESSIONAL EXPERIENCE

Software Engineer (C++, Rust)
BAE Systems

January 2023 - Ongoing
Portsmouth, UK

Royal Navy Combat Systems Modernisation

- Developed real-time data processors in Rust within an Agile Scrum team, contributing towards the Royal Navy's £285m RECODE combat management systems modernisation contract and NATO's push towards memory-safety.
- Proposed and implemented efficient algorithms and data structures to meet requirements, including geospatial indexing and deterministic scheduling for scalable distributed Kubernetes-based systems.
- Reviewed team code through pull requests, improving codebase quality and test coverage.
- Advocated for and introduced modern Rust features to the team, enhancing code readability and performance.

Training Simulation Secondment

- Implemented and tested new requirements in legacy C++03 training and simulation systems, successfully extending the solution lifespan via additional specifications.
- Applied Model-Based Software Engineering (UML and SysML under the NATO Architecture Framework v4) to document solution architecture and cross-company communication.
- Created a test procedure document generator using Python and Pandas, reducing delivery timelines from weeks to days.
- Facilitated the smooth integration of supplier assets by fully testing software and planning and documenting transition processes.
- Mentored a graduate engineer with no C++ background, guiding them through advanced concepts and ensuring contract deliverables were met.

Software Engineer (C, C++)
Raymarine

August 2019 - August 2020
Fareham, UK

- Built the embedded Yachtsense Digital Control System UI using C++17, delivering a modular and extensible interface for rapid feature deployment.
- Developed a NMEA 0183/2000 processor to enable seamless communication between legacy and modern maritime equipment.
- Took initiative to develop a high-performance string builder utility, reducing runtime overhead compared to STL standards. This earned team commendation and achieved widespread internal adoption.

EDUCATION

Master of Mathematics (MMath, Distinction)
University of Portsmouth

September 2016 - July 2022
Portsmouth, UK

Masters Thesis (<https://cloud.robertfry.xyz/s/Thesis2022>)

A CATEGORICAL INTERPRETATION OF KLEINBERG'S IMPOSSIBILITY THEOREM FOR CLUSTERING

- Clustering algorithms group data points by a measure of similarity. Using category theory, three commonly desired but mutually exclusive properties of clustering algorithms were generalised to find measures of similarity where these properties coexist.

Bachelors Project (<https://cloud.robertfry.xyz/s/Thesis2021>)

A RESEARCH PROJECT FOR THE NTRU CRYPTOSYSTEM

- The NTRU cryptosystem, part of the NIST post-quantum standardisation effort, is designed to replace RSA with resistance to quantum attack vectors. Following research into the underlying mathematics, a C++17 library was designed and implemented.

NOTABLE PROJECTS

Director of the Emsworth Slipper Sailing Club Ltd

January 2023 - Ongoing

- Serves on the general committee, oversees the club's day-to-day operations, and contributes to strategic decisions.
- Responsible for taking minutes for the sailing sub-committee, ensuring accurate documentation and effective follow-up actions.
- Teaches sailing to youth members as a qualified RYA Dinghy Instructor, and regularly races in Chichester Harbour.

Engine Monitor

Ongoing

- Developing a real-time equipment monitoring system, using the i.MX RT1062 microprocessor, to generate NMEA data for leisure maritime engines lacking first-party instrumentation.
- Leading C++17 firmware and cross-platform desktop companion development, collaborating closely on hardware integration.