

Damien Ruscoe

Senior C++ Software Engineer

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Personal Profile

A passionate and technically rigorous Software Engineer with over 18 years of industry experience, specializing in complex software development challenges including low latency systems, compiler technologies, and embedded development. Expert in C++ with complementary Python expertise, I thrive when tackling intricate technical problems that demand innovative solutions. Currently seeking opportunities to apply my extensive experience to high-performance applications within the financial sector.

A dedicated technology enthusiast who remains actively engaged with the developer community through regular participation in professional conferences and meet-ups, including the ACCU C++ developer conference. Driven by intellectual challenge rather than routine, I bring a combination of deep technical knowledge and unwavering curiosity to every project.

Core Skillset

- Advanced C++ Expertise** Expert in utilizing C++ with advanced utilization of STL data structures and algorithms.
- Optimization Strategies** Thorough comprehension of C++ optimization strategies, enabling the creation of high-performance software solutions with optimal runtime efficiency.
- Compiler Optimization Proficiency** Skilled in maximizing runtime performance through comprehensive knowledge of compiler optimizations and the understanding of the hardware memory model.
- Network Protocol Proficiency** Experienced in working with a diverse range of network protocols, encompassing fundamental transmission protocols to application layer protocols.
- Template Metaprogramming Expertise** Deep understanding and accomplished in the application of C++ templates for generic programming and also employing template metaprogramming techniques for compile-time computations.
- Code Clarity and Maintainability** Committed to code clarity and maintainability, consistently applying Clean Code and SOLID principles, along with appropriate design patterns to facilitate long-term maintainability and scalability.
- Linux Expertise** Extensive familiarity with Linux as the preferred OS, both personally and professionally, leading to a profound understanding of its intricacies.
- GCC Toolchain Utilization** Proficient in utilizing the GCC toolchain, with a particular emphasis on leveraging GDB as the debugger of choice.
- Continuous Learning and Integration** Maintains an avid interest in modern C++ advancements, integrating new features introduced in language standards to enhance software development practices.

Career

Qube Research

<https://www.qube-rt.com/>

Sept-Nov 2024

A hedge fund handling a large volume of data with low latency. A solution was required to deliver large data streams to the attention of quant analyzers with minimal latency. Contracted for my experience in C++ and wxWidgets I guided a talented team to a successful design and implementation of the framework transporting this data. Levering C++20 couroutines developed a GUI interface to reduce boilerplate and eliminate potential GUI threading issues.

Responsibilities

- Developed a modern, cross-platform GUI to efficiently monitor and manage a HFT data pipeline.
- Designed and implemented a scalable, low-latency data pipeline from scratch to transport data to the GUI.
- Leveraged C++20 coroutines to interface the GUI thread with a highly multithreaded backend.
- Implemented a native desktop application to view real-time instrument pricing and trading positions.
- Enable management of financial and monitoring compliance with financial regulations for traded assets.
- Designed native widgets to provide granular views on large data for monitoring of potential financial regulation violations
- Integrated restrictions providing visual indicating pending actions required for regulatory compliance.
- Led the training of financial developers in the nuances of GUI design and implementation.

Technologies Used

C++ 20

STL

Python

C#

wxWidgets

QA Systems

(Formerly Information Processing Limited)
<https://www.qa-systems.com/>

2018-2024

Collaborating closely with a compact team comprising five adept developers, our central objective entailed the upkeep and advancement of Cantata: the firm's C++ testing utility. Leveraging a source-to-source transformation approach, the tool seamlessly integrates generated C++ code into clients' codebases, facilitating test generation, instrumentation, and runtime profiling, thereby enabling compliance testing for clients to certify their projects under desired regulatory standards. Expanding upon the foundation of the EDG (Edison Design Group) compiler technology necessitated a profound comprehension of the nuances and complexities inherent in the C++ language.

Responsibilities

- Led the development efforts as the primary developer to implement C++20 feature support in the company's tools, enhancing the tools' functionality and competitiveness in the market.
- Proficiently debugged complex issues and generated templated code, demonstrating a deep understanding of templating techniques and their application in real-world codebases.
- Elevated the codebase to adhere to modern C++ standards, enhancing readability, maintainability, and scalability by leveraging language features and best practices.
- Conducted a comprehensive analysis of the codebase to collect metrics and pinpointed areas for optimization. Successfully implemented improvements, resulting in a notable 45% performance boost in key scenarios.

Technologies Used

EDG (Edison Design Group) compiler technologies

C++

Python

templates

C

concepts

GCC toolchain

MSVC toolchain

GDB

ranges

creduce

STL

Linux

neovim

git

constexpr

SN Systems

Sony PlayStation
<https://playstation.com/>
<https://uk.linkedin.com/company/sn-systems>

2014-2018

In my capacity as a Software Engineer in Test, my principal responsibility revolved around ensuring that the Sony PlayStation toolchain being shipped met the desired professional standards of quality.

Responsibilities

- Working on the proprietary PlayStation platform toolchain, developing tests and internal tools.
- Spearheaded the validation of a compiler scheduling static analyser, later integrated into the LLVM compiler as LLVM-MCA, ensuring optimized performance of code generation.
- Development and automation of tests for software running on PlayStation development consumer gaming platforms.
- Developed a full automation library for the building, execution and play simulation of AAA games saving 400 developer hours per release cycle.

Technologies Used

C++ Python Groovy Jenkins GCC toolchain Make Ninja Linux LLVM creduce clang
Distributed Build Tools git VIM Subversion (SVN)

Imagination Technologies

(Now MIPS Inc.)
<https://imaginationtech.com/>
<https://mips.com/>

2006-2014

During my tenure at Imagination Technologies, I contributed extensively to the development of CodeScape, the company's proprietary debugger used to target META, MIPS and PowerVR CPUs and GPUs. My responsibilities spanned a comprehensive range of technologies, from extending and enhancing the graphical user interface for optimal usability to enhancing the core functionality and facilitating network communication with hardware targets. As the product evolved, I played a pivotal role in augmenting its capabilities, transforming it into a robust tool with features reminiscent of an integrated development environment (IDE) and also featuring a terminal emulator.

Working within a dynamic team comprising seven seasoned engineers provided me with invaluable opportunities for professional growth. Through collaborative efforts and mentorship, I refined my innate abilities and acquired proficiency in various technologies. Notably, my involvement in leading the development of the VT100 terminal emulator fueled my passion for Linux, affording me insights into the inner workings of Linux shells. This experience not only solidified my expertise but also instilled in me a deep appreciation for the intricacies of Linux systems.

Responsibilities

- Lead developer on the VT100 terminal emulator which achieved an impressive standard of VT100 conformance.
- Integrated internal data structures across multiple Real-Time Operating Systems (RTOS) platforms, including MEOS, FreeRTOS, ThreadX, and Nucleus.
- Actively contributed to open-source projects utilized within the product, fostering collaborative development and ensuring continuous improvement of critical components.
- Implemented code with a test-driven methodology for enhanced code quality.
- Specialized in the development of breakpoint support becoming the technical expert for that area of the product.
- Engineered a GUI test system primarily for system testing, utilizing a bespoke networking protocol, resulting in the establishment of two additional test engineering roles, thereby fortifying the testing infrastructure and optimizing the product's quality assurance processes.
- Extended embedded target development focused on enabling TCP/IP to JTAG communications, enhancing debugging and communication capabilities for improved efficiency and reliability in embedded systems.
- Provided technical leadership and mentorship to 5 engineers within the development and quality assurance departments.

Technologies Used

C++ Linux Python PowerVR MIPS META ARM Embedded Development GCC Toolchain RTOS Networking
VIM Open Source Contributions Make CVS

Education

University of Manchester Institute of Science and Technology

UMIST
<https://www.manchester.ac.uk/>

2002-2004

I chose to pursue a course in Mathematics with Software Engineering at university because I sought a more challenging academic experience that would keep me engaged. Having already acquired skills in computing and programming, I wanted to delve deeper into a field that would push my intellectual boundaries further. Mathematics, with its intricate problem-solving and analytical aspects, presented itself as the perfect fit.

Qualifications

BSc. Mathematics with Software Engineering

Eccles College

<https://eccles.salfordcc.ac.uk/>

2000-2002

Qualifications

Mathematics Further Mathematics Computer Science Physics