Michael R. Elliott

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Software Engineer / Architect

Traditionally software development methods and methodologies in this field have been stuck in the past. I have been, and remain, a tireless promoter and practitioner of modern practice in embedded software engineering – not only as an advocate but also an enabler, as I have been developer of and a key author in producing the current government (US and European) standards which allow modern practices in aircraft operating in civil airspace and, by extension, other safety-critical domains and applications.

Modern Software Best Practices • C++ • Java • Scala • Formal Testing and Validation
Application of Software Engineering Concepts • Tool and Process Development
Agile Software Methods • Airworthiness and Safety • Training and Mentoring

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aicas GmbH, Karlsruhe, Baden-Württemberg, Germany and Huntington Beach, California • 2016 – 2018
Senior Software Engineer

Focusing on the use of Java in embedded, real-time systems, provided software architecture, design and implementation of numerous in-house projects to support customers and their sales teams. These projects included machine learning, FPGA chipset access, image recognition, motor control and IoT applications for Siemens, Xilinx, Fiat-Chrysler and others.

Created several application notes to provide customers with detailed step-by-step directions on how to use various aspects of the product line and provided customer training on how to best utilize company's products.

Ported the aicas Java Virtual Machine to run in the PikeOS real time operating system (RTOS) while enhancing support for Embedded Linux, VxWorks and QNX RTOS products.

THE BOEING COMPANY, Long Beach, California • 2003 – 2015
Technical Lead Engineer – C-17 and B1-B Projects

Software Engineering generalist responsible for planning, defining, developing maintaining, delivering and modernizing tools to enhance the productivity and efficiency of avionics software development and testing for the C-17. Provided technical vision for product line design and software life cycle support especially in areas of avionics systems. In addition to avionics software development, specific daily tasks involved the architecting, implementing and supporting a wide variety of tools, both desktop and web-based, including those for automated test analysis (in Java and Scala), communication system design and implementation, and peer review tracking. Designed and implemented a prototype replacement for the C-17 communications control system (primarily in Java) using modern software practice to greatly enhance the reusability of individual components and drastically reduce the ongoing cost of software maintenance. Created multiple desktop programs in Java and Scala to enhance the productivity of avionics programming staff who were required to work in legacy environments such as JOVIAL. Using Java and Swing, developed the tablet-based controls (including networking, API and the user interface) for managing an airborne encrypted radio system. Trained software developers in intermediate to advanced techniques of software development in Ada, Java and Perl. Mentored junior members of the staff in modern programming best practices, object-oriented programming and software engineering design patterns and their application in practice.

Architected, designed and implemented (primarily in Java) the ground station for the B1-B Integrated Battle System. Worked with the USAF customer to adapt the initial requirements to the practical needs of the aircraft environment, and teamed with USAF personnel to integrate the ground station into their mission planning domain. Along with the system safety architect, successfully defended the use of the Java programming language in the Future Combat Systems project, thereby saving an estimated $500 million in existing software from being unnecessarily replaced.

Provided training at two Boeing Software Conferences in *The Real-time Specification for Java* and *Real-time Garbage Collection*. Gave presentations at multiple Boeing Technical Excellence Conferences on software safety, reusability, best practices and lessons learned on the C-17 and B1-B projects.

Over a period of five years, along with approximately 120 other airborne safety professionals from around the world, developed DO-178C – the new FAA and EASA standard for safety-critical software in airborne applications. Key author of DO-332 – *Object-oriented Technology and Related Techniques* – the DO-178C supplement which now facilitates modern software practice in commercial aircraft systems.

CALIFORNIA APPLIED TRADING SCIENCE, Beverly Hills, California • 2002 – 2003
Operations Manager

Successful creation and delivery of all required reports for regulatory compliance including real-time short rule checking and NASDAQ trades. Set up and managed remote real-time trade engines located at the Chicago Board of Trade and the New York Mercantile Exchange. Researched and implemented necessary steps to comply with formal and legal requirements for NASDAQ and SEC record keeping and transaction reporting. Created portions (in Java) of the company's trade engine involved in the use of the FIX and ITCH financial network protocols.

AXIOM NAVIGATION, Costa Mesa, California • 2001 – 2002
Principal Engineer

Introduced software development methods and processes based on object-oriented programming, test driven development and Extreme Programming practices to establish quality, robustness and responsiveness to changing product definition and customer requirements, marketing priorities and business planning. Reorganized and refactored existing product line of embedded software in C and C++ in order to support modular development, enhanced quality and additional product lines.

SUN MICROSYSTEMS, Los Angeles, California • 1998 – 2001
Lead Engineer

As the lead engineer for Sun Microsystems in a joint project with Wind River Systems, provided management liaison between the two companies and supervised the integration with and porting of the Java Media Framework to a Java-enabled prototype of a tablet based computer developed for Intel and running VxWorks. Provided the overall software architecture and detailed software design for a Java-based video conferencing system being built by Cisco Systems. This included simulation of the hardware, multi-threaded hardware control through JNI, embedded browser integration, graphical user interface component design, database access and maintenance and integration with VxWorks. Ported major portions of the Personal Java JVM and its environment to several embedded platforms, including the PowerPC, Intel Pentium and StrongArm processors.

INTERSTATE ELECTRONICS CORPORATION, Anaheim, California • 1992 – 1998
Staff Engineer

Developed and managed the software for field trials of aircraft range monitoring systems, including supervising and participating in their deployment at customer sites in South Korea and Taiwan. Designed and implemented portions of the firmware of Global Positioning Satellite (GPS) receivers while providing the primary guidance as to how such designs could be efficiently implemented with the selected compiler and runtime. Designed and implemented critical portions, including RAIM compliance and message exchange and validation of a Differential GPS ground station used for precision landing guidance of commercial aircraft. Chief programmer and software architect for the ballistic missile launch monitoring system installed at the US Army Kwajelein Atoll missile range with an emphasis on vehicle trajectory analysis and performance evaluation.

EDUCATION

Master of Science in Computer Systems Engineering
Edinburgh University • Edinburgh, Scotland

Bachelor of Science in Information and Computer Science
University of California • Irvine, California

US Secret Clearance (inactive)

FAA Airman's Certificate • Airplane Single Engine Land
Veteran • US Navy
List of Publications Available on Request