Name: Stephen Edwards

Nationality: British

Resident: London, United Kingdom & Prague, Czech Republic

Languages: English (Native)

Expertise honed over 20+ years of passion for computing, specializing in the full software development life cycle—from concept and architecture to design and delivery—of complex, high-performance, and scalable applications across desktop, mobile, web, and cloud platforms. More recently, including AI technologies.

* Many successfully delivered large- and small-scale projects.

# Client Summary

Zeiss, Germany Contract Healthcare - 2.5 Years

Lexis Nexis, England Contract Legal - 4 Months

Horizon Discovery, Cambridge, England Permanent Healthcare - 2 Years

General Electric Healthcare, Germany Contract Healthcare - 8 Years

LondonLinq, England Contract Healthcare - 1 Year

ED & F Man, London, England Contract Finance - 1 Year

Sony Europe, Basingstoke, England Contract Finance - 1.5 Years

Energyhelpline.com, London, England Contract Energy - 1 Year

Red Letter Days, London, England Contract Media - 1.5 Years

Global Care Solutions (Bangkok, Thailand) Contract Healthcare - 1 Year

Reed Business Information (RBI) Contract Media - 1 Year

Transport for London (TfL) London, England Contract Transport - 1 Year

**Tech Stack Overview**

**General Programming**

* **Languages:** C#, Python, JavaScript, TypeScript, VB.NET, C/C++ (Native and Managed), x86 Assembler, .NET IL, ARM Cortex M (Assembler + C)
* **Frameworks & Concepts:** .NET / .NET Core, TPL, Async & Threading, PLINQ, COM Interop, Remoting
* **Protocols & Messaging:** MQTT (MQTTNet, Mosquitto), HTTPs, WebSockets

**Client-Side Development**

* **Modern:** Blazor (Server-side), MAUI, WPF, ASP.NET Core MVC
* **Web & UI Frameworks:** Angular (v6–10), JQuery, Bootstrap, ASP.NET Web Pages
* **Legacy & Desktop:** WinForms, ASP.NET MVC, MFC, Win32, Silverlight, CodedUI
* **Patterns & Tools:** MVVM, MEF, Unity

**Server-Side & Cloud**

* **Cloud & Azure Services (Recent):**
  + Cosmos DB (SQL API), Service Bus, Container Instances, Batch, SignalR, AD, Durable Functions
* **Architectures:** Domain-Driven Design (DDD), CQRS, Microservices, Serverless
* **Data Access & Storage:**
  + EF Core (Cosmos & SQL providers), MongoDB, MS SQL Server, ADO.NET, MySQL
  + Multi-dimensional DBs (OLAP/MDX), Data Warehousing, MDBs (Tamino, Btrieve, eXist)
* **Communication & Integration:** RESTful APIs, WCF, SOAP, JSON, XML, Web API, MSMQ, NServiceBus
* **Other:** WWF, Azure SQL, XSD, XSLT, WSDL

**AI & Machine Learning**

* **Languages & Frameworks:** Python, LangChain, VectorDBs, FAISS, TensorFlow, PyTorch, OpenCV
* **Models & Use Cases:** CNN (image processing), RNN, DQN (deep reinforcement learning)

**Infrastructure & DevOps**

* **CI/CD & Deployment:** Azure DevOps (pipelines, release management, support), Jenkins, Git, GitHub Copilot, TFS
* **Testing Pipelines:** MS Test, MS Fakes, NUnit, XUnit, SpecFlow, Selenium, CppUTest, Google Test/Mock
* **Containers & Virtualization:** Docker, Azure Container Instances
* **Embedded & Toolchains:** STM32CubeIDE, SEGGER Embedded Studio, Arduino
* **Tooling:** Visual Studio 2019–2022, VS Code, JetBrains Rider & ReSharper
* **Mocking:** MOQ, TypeMock

**Patterns & Methodologies**

* **Software Architecture:** Clean Architecture, N-Tier, Monolithic, Service-Oriented
* **Principles & Practices:** TDD, S.O.L.I.D, OOD, DDD, CQRS, Scrum, Lean Startup
* **Engineering Fundamentals:** Algorithms & data structures, Big O notation, time/space complexity

# January 2023– Current

**Senior Software Architect and Engineer**

**Zeiss,** Munich**,** Germany

As Senior Software Architect and Engineer on the CORI platform, I played a key role in designing and implementing a secure, scalable system for remote services and telemetry management across Zeiss medical and industrial devices. The platform supports distributed, asynchronous, and synchronous communication between on-premise devices and the cloud, improving diagnostics, maintenance, and customer onboarding processes.

**Key Responsibilities & Contributions:**

* **Architectural Leadership:** Drove improvements to the system architecture across Agent, Gateway, and Cloud components, ensuring a clean separation of concerns and scalable, maintainable codebases.
* **IoT Communication & Edge Computing:** Designed robust edge-to-cloud communication using **MQTT**, **Azure IoT Hub**, and **Azure IoT Edge**, enabling reliable remote interaction with critical medical devices.
* **Secure Distributed Messaging:** Integrated **MQTTNet** and **Eclipse Mosquitto** for telemetry and bi-directional messaging; defined event-driven interfaces using **AsyncAPI**.
* **Development Leadership:** Led development efforts across distributed teams, refining workflows and introducing best practices in architecture, resilience, and testing.
* **AI-Powered Information Retrieval (RAG):** Built a proof-of-concept system using **LangChain**, **FAISS**, and **GPT-4o** to enable natural language querying over product documentation and service calendars, enhancing efficiency for service personnel through context-aware search and metadata filtering.
* **Cross-Team Collaboration:** Captured and aligned system requirements across multiple device teams, balancing stakeholder needs and regulatory constraints.
* **Testing Culture:** Promoted **Test-Driven Development (TDD)** and integrated automated testing into the development lifecycle, particularly with offshore teams.

**Technologies & Tools:**  
C#, C, C++, Java, .NET (Core & Framework), Azure IoT Hub, Azure IoT Edge, MQTT, MQTTNet, Eclipse Mosquitto, AsyncAPI, Microservices, Serverless, LangChain, GPT-4o, FAISS, TDD, Git, Azure DevOps

# October 2022–January 2023

**Senior Software Engineer**

**Lexis Nexis,** London**,** England, UK

Worked on a core legal tech product at LexisNexis, focused on scalable database extensibility and internal developer tooling. My work centered around enhancing the product’s data architecture using **Entity Framework Core**, introducing tooling to streamline developer workflows, and ensuring product flexibility through client-specific extension support.

**Responsibilities & Achievements:**

* Designed and implemented a robust **Entity Framework Core** model and migration strategy, enabling seamless extension of product databases by internal and external teams.
* Collaborated directly with client teams to capture requirements and integrate requested extensions into the domain model, ensuring product alignment with legal industry needs.
* Leveraged **C# Source Generators** via the **.NET Compiler Platform (Roslyn) SDK** to create internal developer tools for managing schema snapshots and automated migration generation.
* Employed **Test-Driven Development (TDD)** using **xUnit** to ensure maintainable, reliable, and high-quality code.
* Contributed to architectural improvements and enforced coding standards across the codebase to maintain performance and consistency.
* Integrated Git-based tooling to align code-first database evolution with CI/CD processes and version control best practices.

**Tech Stack:**  
C#, SQL, .NET, Entity Framework Core, Git, Roslyn SDK (Source Generators), Visual Studio, xUnit  
**Methodologies:** TDD, Agile/Scrum

# December 2020–October 2022

**Senior Software Engineer**

**Horizon Discovery,** Cambridge**,** England, UK

Led the design and implementation of a **cloud-based automated cell line manufacturing workflow**, enhancing accuracy, reproducibility, and operational efficiency in a highly specialized biotech environment. The project combined **AI-driven image analysis**, **IoT device orchestration**, and **Azure-native cloud services** to automate traditionally manual laboratory processes.

**Responsibilities & Achievements:**

* Developed a robust and resilient **automation platform** that integrates with lab robotics, incubators, and imaging equipment to execute end-to-end workflows with minimal human intervention.
* Built a CNN-powered **image processing pipeline** using **Python**, **TensorFlow/PyTorch**, and **OpenCV** to assess cell growth and clonality, improving diagnostic speed and reliability.
* Designed failure recovery strategies and built fault-tolerant mechanisms across the pipeline, reducing system downtime and ensuring continuous lab operations.
* Architected and implemented real-time monitoring and user interaction frontends using **Blazor** and **.NET Core 3.x–6.0**, giving scientists live insights into experiments and workflow status.
* Integrated with key third-party lab software including **Benchling**, **Green Button Go**, and **CellMetric**, ensuring interoperability across diverse systems and equipment.
* Utilized a broad range of **Azure services** such as **Service Bus**, **Cosmos DB**, **Batch**, **SignalR**, **Durable Functions**, **Event Grid**, **Managed Identities**, **Blob/File Storage**, and **Container Instances** for scalable and secure cloud orchestration.
* Applied **TDD principles** and worked within an **Agile/Scrum** environment to maintain a high standard of code quality, traceability, and deployment confidence.

**Tech Stack & Tools:**  
C#, Python, YAML, XML, .NET Core (3.x–6.0), Blazor, WPF, Docker, Git, Azure DevOps, MS Teams  
**Cloud Platforms & Concepts:**  
Azure (Durable Functions, Event Grid, Service Bus, Cosmos DB, SignalR, Blob/File Storage, ACI, Azure AD), Microservices, Serverless  
**Lab Integrations:** Benchling, Green Button Go, CellMetric  
**AI/ML:** CNNs, TensorFlow, PyTorch, OpenCV  
**Methodologies:** TDD, Agile

# January 2020–October 2020 (10 Mths)

**Senior Software Engineer**

**LondonLinq,** England, UK

**Independent R&D Projects – IoT, Embedded Systems & Cloud Microservices**

**Self-Directed / Collaborative Innovation Projects**

**1. Infrastructure-less Ranging for Contact Tracing (IoT & Embedded Systems)**  
Explored innovative solutions for more accurate contact tracing during the COVID-19 pandemic by leveraging **UWB**, **BLE**, and **ultrasonic** technologies to improve precision over smartphone-based tracking.

**Key Contributions:**

* Led a feasibility study and prototyping effort for a **low-cost wearable contact tracing device** using **Ultra-Wideband (UWB)** for infrastructure-less peer-to-peer ranging.
* Evaluated UWB hardware (e.g., **Decawave DWM1001**), embedded platforms (**STM32**, **Nordic nRF52840**, **Mbed RTOS**) and toolchains for rapid prototyping.
* Built embedded firmware for **ARM Cortex-M4** devices supporting power-aware ranging, data collection over **BLE**, and **debugging via JTAG/SWD**.
* Developed a **.NET Framework backend** for BLE data aggregation and a **.NET Core MVC frontend** for visualizing device interaction and contact proximity events.
* Supported collaborative proposal efforts to secure further development funding.

**Technologies:**  
C, C++, C#, UWB (Decawave), BLE, .NET Core, .NET Framework, ARM Cortex-M, STM32, Nordic SDK, TensorFlow Lite for Microcontrollers, TDD (CppUTest), JTAG/SWD, Git, Azure DevOps

# January 2017–September 2019 (3 Yrs)

**Senior Software Engineer and Architect**

**General Electric** **Healthcare** Dornstadt (Ulm), Germany

Led the successful delivery of GE Healthcare's global **“Digital Twin”** diagnostic and monitoring platform, supporting predictive maintenance, incident analytics, and integration with Salesforce. Spearheaded platform modernization, introduced scalable architectural patterns, and guided engineering practices across a globally distributed team.

**Key Contributions:**

**1. Diagnostic & Monitoring Platform Modernization**

* Architected the migration of legacy systems to a **.NET-based, n-tier, service-oriented platform** leveraging **CQRS**, **Event Sourcing**, and **Microservices**.
* Designed and implemented reference architectures using **WCF**, **WPF (MVVM)**, **Entity Framework**, **SQL Server**, and **MongoDB**.
* Introduced **TDD**, **unit testing**, and **Git-based workflows** to enhance code quality and team collaboration.
* Championed **Domain-Driven Design (DDD)** to align development with evolving business requirements and improve system maintainability.
* Mentored engineers and conducted **.NET architecture and development training**, driving consistent engineering practices across teams.
* Facilitated full system handover to a global rollout and support team.

**2. Release & Change Management Application**

* Managed and mentored a team of **remote Angular developers**, ensuring seamless integration with backend services.
* Collaborated with business analysts to define domain models and incrementally evolved **SQL schemas** and **EF Core** implementations.
* Developed custom **SOQL LINQ-style query integration** to enable backend communication with **Salesforce APIs**.
* Implemented security infrastructure using **IdentityServer4**, **OAuth2**, and **OpenID Connect**.
* Built robust data migration layers across **SQL**, **MongoDB**, and Salesforce with comprehensive audit trails and validation.

**Technologies & Tools:**

C#, .NET Core, .NET Framework, ASP.NET Core MVC, WPF, WCF, Web API, REST + HATEOAS, OData, Angular, TypeScript, JavaScript  
Entity Framework Core, SQL Server, MongoDB, MySQL, Salesforce API, SOQL  
CQRS, Event Sourcing, Microservices, MSMQ, IdentityServer4, OAuth2, OpenID Connect  
TensorFlow 2.0 (experimental), Python, SISENSE Analytics, Jenkins (CI), Swagger  
Agile/Scrum, Rally, Git, Visual Studio, VS Code, XML/XSD/DTD

# January 2015 – December 2016 (2 Yrs)

**Senior Software Engineer and Architect**

**General Electric Medical Systems Information Technologies GmbH** Freiburg, Germany

Brought into an established engineering team to modernize and enhance **CardioSoft®**, GE’s clinically precise diagnostic platform for ECG, stress testing, ambulatory BP, and spirometry. Though initially unfamiliar with legacy tech like **MFC** and **Btrieve**, I embraced the challenge and successfully drove improvements across UI/UX, testing infrastructure, data access, and modernization strategies—all while enhancing the engineering culture and development workflow.

**Key Contributions:**

**Architecture & Modernization:**

* Re-architected major application components using a variant of **Model-View-Presenter (MVP)** to enable **testable UI patterns**.
* Introduced **WPF-MFC interoperability**, delivering a prototype to show how legacy applications could evolve with modern UI capabilities.
* Built a **web-based UI module** using **Angular 2**, **Node.js (Express)**, and **SQL Server**, replacing legacy ISAPI functionality and introducing scalable web integration.
* Developed an asynchronous **C++ Node.js add-on** using **V8 API** and **Node.js/Nan**, enabling reuse of core DSP functions in the new web layer.

**Performance & UX Improvements:**

* Applied **x86 SIMD** optimizations to legacy **DSP functions** (e.g., FFT), dramatically improving signal processing performance.
* Resolved significant **UI performance bottlenecks** with large datasets via **virtualization** in custom controls.
* Enhanced UX by implementing **async data access**, **cancellable long-running operations**, and **uniform progress feedback** across the app.
* Adapted custom graphing (e.g., ECG) and UI controls to be **DPI-aware**, ensuring usability on modern high-resolution monitors.

**Testing & Engineering Culture:**

* Introduced **Test-Driven Development (TDD)** with **Google Test/Mock** for C++ code and integrated tests into **TFS CI pipelines**.
* Evaluated and deployed automated **UI testing tools** (Ranorex, Coded UI); implemented **MS Active Accessibility (MSAA)** for legacy control compatibility.
* Promoted modern **C++ practices** such as templating and generic programming to improve flexibility and maintainability.
* Mentored team members in **unit testing**, **source control with Git**, and **continuous integration workflows**.

**New Feature Implementation:**

* Helped deliver a **completely new spirometry modality**, integrating robust lung function testing capabilities into the platform.
* Built a flexible **data access layer** supporting **Btrieve**, custom file-based formats, and **SQL Server**, enabling a smoother path toward full modernization.

**Technologies & Tools:**

C++, C++11, C, MASM, STL, Boost, MFC, WPF, Win32, CodeJock, Node.js/Nan, Express.js, Angular 2, JavaScript (ES6/TypeScript), ASP.NET MVC 5  
SQL Server, Btrieve, Google Test/Mock, Visual Studio, Visual Assist, TFS, Git, SIMD, FFT, Ranorex, Coded UI, MSAA, TDD, MVP, XAML

# January 2013 – December 2014 (2 Yrs)

**Senior Software Engineer / Technical Lead**

**General Electric** **Information Technology GmbH** Freiburg, Germany

Led the architecture and core development of a sophisticated **enterprise cardiology IT platform**, delivering secure, performant, and interoperable solutions for data acquisition, workflow management, and system integration across clinical environments. Focused on performance, scalability, interoperability, and maintainability in line with industry standards (**DICOM**, **HL7**, **TLS**).

**Key Responsibilities & Achievements:**

**Architectural Leadership & Framework Modernization:**

* Re-architected the dynamic **WPF UI framework** to resolve severe performance issues while maintaining backward compatibility with legacy layouts and storage definitions.
* Enabled seamless integration of **WinForms**, **Win32**, and **MFC screens** into WPF applications, facilitating progressive modernization.
* Designed and implemented **custom WPF controls** tailored for medical data acquisition, dynamic form generation, and interactive visualizations.

**Innovation in Dynamic UI & Layout Systems:**

* Extended the dynamic UI layout engine to support **complex nested layouts**, **many-to-many relationships**, formula-based fields, and embedded scripting logic.
* Built a **graphical form designer** to support non-technical configuration and layout creation.
* Delivered a prototype **web-based frontend** (ASP.NET MVC 5) supporting dynamic layouts, paving the way for future web enablement.

**Testing, Tooling & Process Improvement:**

* Championed **Test-Driven Development (TDD)**, introducing it across the engineering team alongside mentorship and architecture guidance.
* Introduced **Microsoft Fakes** for unit testing and **Coded UI** for UI automation, improving test coverage and reliability.
* Reduced **technical debt** through systematic refactoring and architecture clean-up.

**Standards, Integration & Interoperability:**

* Worked on interoperability with medical data systems using **DICOM** and **HL7** messaging standards.
* Implemented high-performance data serialization using **Google Protocol Buffers (protobuf-net)** for WCF communication, significantly improving throughput.
* Ensured that **non-functional requirements** such as security, auditability, scalability, and fault tolerance were met or exceeded.

**Technologies & Tools:**

C#, .NET 4.0, WPF, WCF, WWF, WinForms, MFC, ASP.NET MVC 5, Entity Framework, Unity, MEF, XAML, SQL Server, Google Protobuf, TFS, Visual Studio, TDD, Microsoft Fakes, Reactive Extensions (Rx), MVVM, Multithreading, TPL, DICOM, HL7, TLS, SCRUM

# January 2012 – January 2013 (1 yr)

**Senior Developer/ Architect**

**ED & F Man** London, UK

Led full-stack development of a new **Commodity Trade Risk Management (CTRM)** platform to provide global visibility into daily trading positions, automate risk factor capture, and generate **Value at Risk (VaR)** reports across the organizational hierarchy.

**Key Responsibilities & Achievements:**

**MasteRisk Platform Development (CTRM):**

* Partnered with domain experts and risk analysts to define a unified **data model** supporting position, pricing, and risk factor tracking.
* Designed and implemented a modern **trade capture application** to replace manual spreadsheet/email-based reporting for global trading entities.
* Built the application using **Silverlight 5 (MVVM)** with **WCF RIA Domain Services**, **MEF**, and **POCO-based entities**, supporting modular extensibility and testability.
* Developed **batch processing pipelines and schedulers** to extract trade data from geographically distributed **SQL Server** instances of the legacy ITAS system.
* Integrated **organizational hierarchy**, **volume/value limits**, and **alerts** to facilitate monitoring and escalation for breaches.
* Extended the system to capture **daily pricing and risk factors**, working closely with quantitative finance teams.
* Contributed to integration of third-party data providers for **automated risk data acquisition**.

**Counterparty Risk System (CPRS):**

* Resolved architectural issues in a large **ASP.NET MVC** project used for managing counterparty exposure.
* Enhanced cross-system data sharing by evaluating and prototyping a **messaging infrastructure** using **NServiceBus over MSMQ**, enabling event-driven updates between **CPRS**, **MasteRisk**, and **MS Dynamics AX**.

**Technologies & Tools:**

C# 4.0, Silverlight 5, MVVM, WCF RIA Services (POCO), MEF, Unity IoC, ASP.NET MVC, SQL Server, Entity Framework 4.0, MSMQ, NServiceBus, Telerik UI Controls, ADO.NET, Visual Studio 2010, ReSharper, TDD

# June 2010 – November 2011 (1.5 Yrs)

**Lead Developer/ Architect**

**Sony Europe** Basingstoke, UK

Contributed to the development of a **high-profile commercial investment management platform** used across Sony’s European operations to model and manage complex commercial relationships with wholesale and retail partners.

The system provides Sony with deep insights into contractual agreements, allowing for the **optimization of commercial incentives**, enforcement of consistent business practices, and ultimately, **improvement of profit margins across European markets**.

**Key Responsibilities & Achievements:**

* Developed core application modules using a **modular WPF architecture** based on **PRISM**, **MVVM**, and **Unity IoC**, enabling clean separation of concerns and scalable module composition.
* Implemented robust service communication using **WCF**, integrating with **Sony’s SAP financial systems** to synchronize contract and financial data.
* Designed dynamic and interactive UIs using **WPF**, **Telerik Controls**, and **Expression Blend**, enhancing user experience for commercial analysts and managers.
* Built additional **client-facing web applications** using **ASP.NET MVC**, supporting cross-platform reporting and user access.
* Applied **TDD practices** using **Telerik JustMock**, **NCover**, and **FX Cop**, ensuring code quality and long-term maintainability.
* Contributed to **CI/CD pipelines** using **TFS**, integrating automated testing and build validation into the development lifecycle.
* Collaborated within an **Agile/Scrum environment**, working closely with business stakeholders across Sony Europe to deliver iterative, business-aligned features.

**Technologies & Tools:**

C# 4.0, WPF, PRISM, MVVM, WCF, ASP.NET MVC 2.0, Windows Workflow Foundation (WF 4.0), Entity Framework, LINQ to SQL, Unity IoC, SQL Server, Expression Blend, Telerik Controls, Telerik JustMock, NCover, ReSharper, TFS, FX Cop, Mingle (ThoughtWorks), Agile/Scrum, TDD

Prior contracts upon request.