Frederick Anthony Sawyer
Senior Senior Software Developer

SUMMARY

Senior Software Engineer with over 20 years of experience in embedded systems, full-stack development, and 3D graphics across medical devices, aerospace, and gaming industries. Expert in C/C++, Qt/QML, OpenGL (including Safety Critical SC), GLSL, and Python, with strong proficiency in Agile methodologies, Azure DevOps, Jira, and automated testing frameworks. Proven track record in developing complex real-time systems, optimizing performance, and leading cross-functional teams. Holds a B.S. in Computer Science with a focus on Simulation and Graphics.

TECHNICAL SKILLS

Main Technical Skills	C/C++/C# (17 yr.), Qt QML (7 yr.), OpenGL (17 yr.)
Programming Languages	GLSL (3 yr.), Python (4 yr.)
C++ Libraries and Tools	C/C++/C# (17 yr.)
Data Analysis and Visualization Technologies	Data visualization (1 yr.)
UI Frameworks, Libraries, and Browsers	XML
Azure Cloud Services	Azure DevOps (3 yr.)
Deployment, CI/CD & Administration	Active Directory, Jenkins (1 yr.)
Methodologies, Paradigms and Patterns	Agile (6 yr.), OOP (8 yr.), SDLC (17 yr.)
Version Control	Apache Subversion, Git
Collaboration, Task & Issue Tracking	Atlassian Confluence (5 yr.), Jira (5 yr.)
Third Party Tools / IDEs / SDK / Services	Eclipse, Visual Studio
Operating Systems	Embedded Linux (13 yr.), Linux (13 yr.), Unix, Windows
QA, Test Automation, Security	JUnit (1 yr.), Unit Testing (3 yr.)
Platforms	Red Hat OpenShift Container Platform
Virtualization, Containers and Orchestration	VmWare

Mail / Network Protocols / Data transfer	WebRTC (1 yr.)
Other Technical Skills	AD, Flash (1 yr.), log (1 yr.), Squish (1 yr.), X (7 yr.)

WORK EXPERIENCE

Senior Software Engineer, Radar Environment Simulator (RES) products

Duration: Jan 2001 – April 2008
Summary:

- Developed real-time embedded and user interface software for KOR Radar Environment Simulator (RES) products
- Employed a VME-based embedded system with Thales or Synergy PowerPC-based processors to simulate radar frequency (RF) targets and electronic counter-measures (ECM) techniques and interfaced with various COTS and KOR-designed hardware
- Engineered target trajectory algorithms for the MFC/OpenGL-based scenario generator/controller
- Created embedded software tools and applications involving RF/ECM algorithms, process communications, and device drivers
- Adapted KOR scenario generator/controller host application to interface with National Instruments COTS signal generators
- Designed and implemented the 1st-generation RES scenario generator/controller using X/Motif and OpenGL

Responsibilities: Develop embedded and UI software, engineer target trajectory algorithms, create embedded tools and applications, adapt host application for signal generators, design and implement scenario generator/controller.
Technologies: C, C++, OpenGL, X/Motif, PowerPC, VME, embedded systems

Senior Software Engineer, Software Group Lead, Tech Deck Live - 3D Shockwave browser-based MMO

Duration: June 2008 – Nov 2009
Summary:

- Managed a team of 7 game software developers to build a 3D Shockwave browser-based MMO for kids based on Tech Deck (Tech Deck Live)
- Leveraged Adobe Director and Flash to develop client application with TCP communications to the server for management of game and client assets
- Managed the software applications group to provide guidance and software architecture expertise
- Provided significant input to the production and design staff to help guide requirements to fully utilize the features of Shockwave and Director to create a real-time 3D rendered experience

Responsibilities: Team management, software architecture guidance, client application development, collaboration with production and design staff.
Technologies: Adobe Director, Flash, TCP communications, Shockwave

Senior Software Engineer, Medical Devices - Radical-7, Root, Rad-97 monitoring devices and Patient SafetyNet

Duration: March 2010 – Sept 2018
Summary:

- Led software design, development, feature expansion, and bug resolution for a new generation of medical devices
- 4 unique medical instruments in total
- Developed GUI for Radical-7, Root, and Rad-97 monitoring devices employing C/C++/ Qt and OpenGL ES on an embedded Linux platform
- Built a multi-threaded system architecture allowing re-use of common modules across multiple devices while creating device specific user interfaces
- Integrated additional 3rd party OEM instruments into Root and Rad-97
- including Capnography, NIBP/Temp, bed sore monitoring, etc
- Added instrument "detail view" to hospital floor monitoring Java application Patient SafetyNet to display plots of all parameters, live waveforms, and system/user events

Responsibilities: Software design and development, GUI development, system architecture design, integration of 3rd party instruments, enhancement of hospital monitoring application.
Technologies: C, C++, Qt, OpenGL ES, Embedded Linux, Java

Principal Software Engineer, Encrypted GPS processing and DRIFC projects

Duration: Dec 2018 – Oct 2021
Summary:

- Supported encrypted GPS processing including MCode GPS and merge functionality from multiple GPS products to a common hw/sw solution to be used for next generation Raytheon GPS products
- Development/testing involves embedded software development with hardware-in-the-loop
- Managed DRIFC3 project embedded software development and releases
- Identified and formulated solutions to various SCR's, performed unit level testing, and full regression testing
- Documented the current DACPro DRIFC post processing tool for porting from Linux to a Windows environment, re-implementing multi-threaded application to single threaded
- Crafted a custom RedHat Linux ISO for VMware installation including software tools and account configurations
- Supported DRIFC2 legacy project to address customer issues, implemented circular buffer messaging scheme using shared memory to provide status from modules without serial port communication, discovered and resolved random memory overflow issue

Responsibilities: Embedded software development and testing, project management, documentation, Linux ISO customization, legacy project support and debugging.
Technologies: C, Embedded software, Linux, Windows, RedHat Linux, VMware, shared memory, hardware-in-the-loop, Jira, BitBucket, Confluence

Senior Software Engineer, HVT2.0 High-Velocity Oxygen Therapy Medical Device GUI

Duration: Oct 2021 – Sept 2022
Summary:

- Worked with a group of 6-8 software engineers to revise GUI for an embedded target using Qt/QML for a new high-velocity oxygen therapy medical device, HVT2

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- Enhanced GUI functionality and robustness including Event Logging, localization for 15 languages, unit tests, general bug fixes and changes to support the design specification, and various utilities to assist verification and validation
- Implemented automated testing utilizing a screenshot generator for localization verification of the supported languages (~220 unique screenshots for each language were required to cover all string translations)
- Designed and implemented fully automated testing using Squish for an Event Log and Alarm testing protocol, reducing a 5 hour manual process to a 10-minute automated test
- Coordinated daily scrums using Teams, 2-week sprints, and utilizing Jira/Jenkins/ Confluence

Responsibilities: GUI revision and enhancement, localization, unit testing, automated testing design and implementation, team coordination.
Technologies: Qt, QML, Squish, Python, Jira, Jenkins, Confluence, Teams

Senior Software Engineer, Synthetic Vision System (SVS)

Duration: Oct 2022 – Dec 2025
Summary:

- Developed the Synthetic Vision System (SVS) which provides a DTED-based terrain view under low visibility conditions including TAWS/HTAWS (Terrain Awareness Warning System), airport/heliports, overlayed symbology, and terrain cultural data
- Engineered 3D out-the-window (OTW) view employing C/C++ and OpenGL SC (Safety Critical) for an embedded processor target
- Executed full-stack development including requirements/test cases/test procedures, supporting data interfaces of external 3rd-party and internal sources, distilling data to utilize OpenGL native data structures, customized and optimized OpenGL Shaders (GLSL), and host window management
- Supported several projects with ongoing requirements definition and testing employing DOORS and Python test scripts
- Coordinated daily scrums using Teams and utilizing Azure DevOps

Responsibilities: Full-stack development of SVS, 3D view engineering, requirements and testing, data interface support, shader customization, team coordination.
Technologies: C, C++, OpenGL SC, GLSL, Python, DOORS, Azure DevOps, Teams

EDUCATION

- **Bachelor of Science Degree in Computer Science**
  California Polytechnic State University, San Luis Obispo, California. Concentration: Simulation and Graphics