

Stephen D. Williams

Software / DevSecOps Engineer / Architect - Data - Robotics - Leadership

Full-stack Web, mobile, embedded, robotics, scalable cloud apps/APIs, security/crypto, startups

This resume: sdw.st/resumed PDF: <https://sdw.st/sdw2023d.pdf>

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Highlights

Database - Recent & ongoing periodic database development, debugging, optimization:

Snowflake development & debugging with very large data lake, complex time series queries from React app.

Timescale & influx time series database: Query builder UX creating complex multi-subquery bucketed queries with data ranges around events with time-based subsampling chained with video & video frame + telemetry.

Postgres / RDS, MariaDB/MySQL, MSSQL, Oracle, Sybase, and other SQL database integration experience.

TileDB, Neo4J, dgraph, Redis, Cassandra, DynamoDB, and other noSQL, graph, document databases.

Designed multiple data models to solve widespread problems: [Universal Resource Assets](#), [MetaRules Workflow Engine](#), W3C binary XML infoset (see below). Beginning work on OpenPress.org using URA, MetaRules.

C++ - Many years developing primarily in C++, integrating with Java (Android), various projects:

While I have spent most of several years developing full-stack web & cloud systems, I have significant background with C++, Java, mobile, and embedded development:

Embedded vehicle app environment - data acquisition, microcontroller temperature & wifi, power modulation.

Custom libWebRTC (Chromium) build for Android set-top box startup.

WebRTC robotic stereo video streaming to remote operator rig WebXR app, motor control, networking.

Development of depth camera array integrated into custom Android camera stack, Movidius bring up of CSI MIPI camera link, high-performance multi-mode multi-threaded image & video rendering engine - as Director of Software Engineering, managed 20 application, platform, and scientific developers. Ported to C++14, MacOS, parallel Linux build, moved to CMake.

Developed ereader app rendering interface to embedded Adobe PDF library, networking plus OAuth from scratch, Java application bridge (JavaGlue) on Android 2.1. Developed large Qt/C++ state machine for complex 54 state desktop ereader app content management system. Extensive use of CMake for complex cross-platform builds.

For various federal government projects, used C++ for application, service, and security related applications.

Created multiple AOL services using C++ in a high scalable application environment, handling thousands of transactions per second on HPUX with Sybase, using a ORM generator I wrote for the project.

Wrote search engine data modules, stock information communication & management systems in C++.

To solve complex requirements on an Air Force project, created a Postscript-like language in C++ with, effectively, a text-based browser + scripted forms, running on DOS with early SMTP links.

Startups

I have fully founded & launched a couple startups, joined several others, and helped more in various ways. It is in my nature to be self-sufficient, curious about everything, and to acquire a wide range of skills when I need them. My adaptability & depth in a wide range of areas is often very useful in startups. I have also worked comfortably in large corporate & government environments, which can be variously helpful directly & indirectly.

My startups:

Insta.com, Inc., ChangeMyPath aka Yebo - Great technology, experience, but co-founders would not pivot.

In bootstrap research & development as I have time & resources - approximately \$100k personally invested:

VolksDroid high quality, very low cost humanoid robotics & associated patented technology.

OpenPress info / doc management, URA content service, workflow processing engine technology & service.

[Blue Scholar Foundation](#) - forming non-profit w/ for profit subsidiaries (Bosch model) for higher education, job & fundamental skills training, globally distributed robotics microfactories, a new type of work / need social service, a new reputation based social network communication service, a general reputation service, exploring solutions for inexpensive resilient rapidly deployed lightweight housing using recycled material, epoxy polymers, and a utility pod system - pursuing grant funding. Writing a pair of books that support this. Initial board members in India, Africa (robotics & entrepreneurial educator), Germany (robotics professor / engineer) with options in Mexico, Honduras, Guatemala (US qualified attorney), Canada, Hawaii (Hawaiian, a retired female tower crane operator) and New Zealand (Maori).

Other startup experience: Renovo Motors, Pelican Imaging (most people went to Apple), OpenFeint (acquired by GREE), Jabber.com, NetWord, ReverseAuction.com, a number of stealth startups.

Overall Experience

With a deep technical, creative, interpersonal, and business background, I comfortably fit a wide range of roles. I am a generalist problem solver who has delved deeply into many technical & industry areas on many interesting projects: Modern full stack web (React, WebCompnt, Mobile (Android), Database: transactional / data lake / time series / embedded, Data architecture, codecs, semantics, standards, DevSecOps + highly secure application architecture & development, Robotics / embedded (mechanical design & invention, CAD, 3D printing, embedded control, streaming video), VR (WebXR Oculus app), Video streaming + codecs (custom WebRTC set top box, nVidia Jetson, video conferencing), Deep awareness / study / prototyping AI/ML/Vision, visualization, UX design, legal (Patent Agent soon), Japanese, Led teams up to 20 in large enterprise, government projects, large & small startups, founded several startups, non-profit. Experience with electronics, fabrication, sourcing, branding & marketing, copyediting, private pilot flying.

Other experience includes: deep mobile dev (custom Android), cameras & imaging (MIPI, Movidius), ebook reader apps, scalable server apps for millions of users, secure app dev, insurance quoting, banking, encryption, PKI CAs, various databases, protocols & standards work (IETF, W3C), and embedded factory machine control. I've run my own servers with DNS, email, web, usenet, and apps on the Internet since 1992. Mobile Android (Java/C++) and desktop Qt (C++) programming, Java/C++/JNI, XML, web services, rendering. Vision recognition. Cray XT3 installation, repair, mgmt.

Created a new approach for robotic actuators (3 patents self-filed patent, 1 issued already); formed a large ANA Avatar XPRIZE contest team creating an avatar system: remote telerobotics for home healthcare & elder care, travel. *Working with Linux, ROS, ROS2, WebRTC, WebSockets, Oculus Quest, mechanical design.*

Experience

- Exploratory projects** **Sunnyvale, CA / Vallejo, CA** **4/2020 To Present**
WebXR, Android, React, React Native, WebRTC, Google Cloud Platform (GCP), TileDB.
Linux, Oculus Quest app, ROS, ROS2, CANbus, WebRTC, websockets, Ortelio cloud robotics, C++, Python, JS.
Mostly ready to be certified as a patent agent. AR/VR/RR. Trained on Udacity's robotics curriculum.
Chatbots, NLP, translation, GAN, video scene understanding.
- Toyota - Woven Planet, Renovo Motors - Senior SW Engineer - UI / full stack 2.5 yrs Palo Alto** **9/2020-2/2023**
Supported AV / ADAS / ECU development support work through time series & data lake database query & visualization app, including video + radar scrub.
Led UI team rewriting & extending management & visualization UI for ADAS (advanced drivers assistance systems - self-driving / autonomous driving technology) research support. *React, webpack, lerna, GraphQL, WebSockets, GoLang, AWS, Docker, Kubernetes, Grafana, Postgres / RDS, Timescale, Influx, NATS, MQTT. Providing other technical architecture & detailed support as needed: security architecture, scalability, Linux, embedded.*
Investigated HTTP/3, WebTransport, communications visualization, bazel, C++, rust, flutter, R-Car.
- Yebo Technologies, formerly: Change My Path - CTO/founder** **San Francisco, CA** **5.5 yrs 10/2014 To 04/2020**
<https://helloyebo.com/> Demo video: <https://sdw.st/y.mp4> <https://cped.co/d>
Creating a scalable self-reinforcing social education platform, entertainment with learning to solve the job skills training gap, meta-learning deficiencies, and later to revolutionize life-long learning in general. Sourced near-shore team members in Mexico & Honduras. Negotiated & closed sales, pitched to investors, board meetings.

For several years, I have been building an ambitious single page web app, a complex integration of 3D game engine (WebGL, ThreeJS), 3D editor, video, rich text editing, slides, and scripting in a highly responsive web app using web components. Several tools published as open source: Merkle Hash web cache builder, completely new panel responsiveness system, async module loading system, Docker, websockets, graph database based app stack.

Deep Javascript, web dev, CSS, full-stack, WebGL, ThreeJS, WebComponents, Polymer, Lit-Element/Lit-HTML, haproxy, nginx, docker, dgraph, NodeJS, AWS, Auth0, Cloudinary.
Instructional design R&D, novel theory of knowledge - concept morphology, invented "panel responsiveness", Merkle hash web cache system, no-build web module load system, anti-browser memory leak techniques.
- Pelican Imaging - Director Software Engineering** **Mountain View, CA** **2.5 yrs 4/2012 To 10/2014**
Building embedded software and SDK for revolutionary depth array camera technology for mobile devices.
 - Screened and interviewed hundreds of candidates. Developed a particularly revealing Socratic interview problem.
 - Solved numerous management, product, and technical problems while managing and working with technical teams, direct and offshore. Acted in management, product, team lead, and deep hands-on development roles.
 - Suggested and drove key product, product marketing, optimization, imaging, computer vision, technology, and methodology ideas, features, and implementation details. Overseeing IT, saved approximately \$100,000.
 - C++11, CMake, apps & dev for Android / web / Qt - MacOS / Qt - Windows. Movidius Myriad 1, JavaGlue, Java
- GREE / OpenFeint - Principal Android Engineer** **Burlingame/San Francisco, CA / Tokyo** **10/2011 To 3/2012**
Built new generation social gaming and casual gaming platform API for Android.
 - Building concise API for game developers use of GREE / OpenFeint social and casual game support features.
 - Support Android, mobile (iOS), and scalable server architecture and development environment and process.
 - Implementing OAuth, JSON, image acquisition, and other capabilities on Android.
- Sony Electronics - Consultant** **San Jose, CA** *contract max 1.5yrs* **5/2010 To 9/2011**
Mobile & desktop eReader - Android, Qt/C++, OAUTH, XML, Adobe RMSDK, DRM, Java, C++, Eclipse, CMake
 - Heavy problem solving, developed new eReader app for Android in Java & C++ and desktop in Qt and C++.
 - Reading view: 2 page mode, RtoL, zoom/pan, page-flip anim., prerender, font swap, bookmarks, and highlights.
 - Implemented all of OAUTH, multi-threaded apps, DRM, Android, Qt applications.
 - Created a DOM-like XML parser in Java from scratch with a Java-optimal API, built-in SAX parser.
 - Forked the XBig Java->C++ integration code generator to become the JavaGlue project.
 - CMake system: MacOS/Linux/Windows/Android, C++/Java/Java->C++/C++->Java, multi-project..
- High Performance Technologies, Inc. - Senior Technical Director** **Arlington, Reston, VA** **~8yrs. 10/2001 To 1/2009**
Development, security, and consulting for 5 main agencies / projects (US Treasury, HHS, DOJ, DoD ATL,

unnamed, DoD HPC), several additional exploratory projects and agencies.

- Active and successful in architecture, development, consulting, management, business development, proposal writing, market and technology research & evaluation, technical interviewing, and program assessment. Projects:
- Army supercomputers, temporal graph analysis, W3C Efficient XML Interchange, DoD Acquisition review team
- DOJ CIO PKI/Security, HHS PKI CA, Treasury FMS Secure Payment System
- Qt/C++, Java, Javascript, Linux, HPC / supercomputers (Cray)

Previous experience:

Concinnous Consulting, Inc. - Owner / Senior Consultant Ashburn, VA 8 yrs. 2/1992 To 9/2001

Geico, Chief Architect Geico's first viable web auto insurance quoting system. MPEG4 File Format encoder.

Contracts:

America Online, Inc., Senior Consultant Tyson's Corner, Reston, Dulles, VA 3 yrs. 4/1995 To 5/1998

Developed [Buddy List](#). Part of [Smithsonian permanent collection](#). Created a [video IM system](#) -Instant Images, first for large video IM service. Digital notary, rate-based protocol video streams.

Bank of America, Consultant Firewall and internal and external web servers - first public web server for any bank.

Lexis-Nexis, Consultant 3 yrs. Feed search engine in C++, RDBMS. Stock quotes in C++, satellite data reception.

Jabber.com, CTO Enhanced features, roadmap for extending Jabber's open IM/Presence system.

Insta.com, Founder Fusion of presence, instant messaging, dynamic web pages, and customer service.

ReverseAuction.com, CTO Architected auction web application, resulting in successful release, scaleup.

GE Aircraft Engines 2.5 yrs. Distributed process diagnostic, recovery. Ported g++, Emacs, Kerberos to HPUX.

Computer Sciences Corp. 1 yr Created language, forms in C++ much like today's HTML Web forms, inline scripting.

GE Lighting 1.5 yr Embedded control bulb machine. New class of bulb: half of the [re-lighting Statue of Liberty in 1986](#).

Education & Training

- American University - **Master of Science, Computer Science** - 4.0 GPA (completed 2013)
- Stanford online: AI: Thrun/Norvig, Machine Learning: Ng; audited: Robotics, Graph Reasoning, Discrete Math
- CISSP 54017, NSA INFOSEC Assessments, Lifetime AAAI. FBI Infragard. IETF, W3C, Certified Scrum Master

Innovation Highlights

- 2022: Self-filed a new robotic joint approach combining low cost / noise / weight with strength, simplicity, 3D printable, few parts, compact support of multiple joints.
- Patent published SPIVT robotic actuator: Filed pro se. Patentable novel web panel responsive algorithm.
- Patent issued for image to texture in 3D games, contributor. Patent filed on May 2010 eReader features.
- Independently invented [CAPTCHA](#) in 1999. Created IM-based multi-person video chat system at AOL.
- Wrote & scaled AOL's Buddylist, inventing independent claims in AOL's Buddylist patent US7454709.
- Founded early ISP, have run Internet servers continually since. Implemented satellite delivery of Usenet.

Examples

github.com/sdwliq - [W3C XBC Measurements Methodology](#) - [W3C EXI Measurements Note](#) - [ESXML](#)

I run multiple half marathons and other races every year, biking, mountain hiking, kayaking, sailing, and inline skating. I have run at least 20,000 miles. I am a private pilot, PADI scuba certified, rock climb, ski, and snowboard. I'm an avid semi-pro photographer: over 100,000 photos taken globally.

One of my publishing venues:

<https://medium.com/missed-points> <https://medium.com/optimalogic>

Recent articles:

[MetaRules Workflow Engine](#)

[Uniform Resource Assets — URA](#)

[Complexity Simplification Escalators](#)

[Session vs. End-to-End Encryption](#)

[The Application Level Window Signaling \(ALWS\) pattern you probably need](#)

[Executive Summary, tl;dr, Abstract, tl;wa](#)

[The Promise and Realities of Technical Education: Computer Science](#)

[Deep security without VPNs](#)

[Sentience Levels: Emotion, Logic, Empathy, Synthesis](#)