# Michael O. Slinn

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I have 45+ years of experience in the computer industry.

I have written three technical books which discussed distributed computing, software security, and advanced programming concepts.

I am the author of many software packages, including EmpathyWorks (an artificial personality adjunct to AI systems), `awslib_scala` (an idiomatic Scala wrapper around the Amazon Web Services Java library), `web3j-scala` (an idiomatic Scala wrapper around a popular Java library for Ethereum), and the Cadenza software product that powers ScalaCourses.com.

Since 1985, I have performed technical due diligence for investors and technology product companies that wish to prepare for investment or sale.

I have worked as a software expert since 2001. I have testified as an expert witness in US federal courts and in Europe. My web site has articles discussing my approach and experience.

## LITIGATION SUPPORT EXPERIENCE

To date, I have been retained 19 times as an expert witness in software; twelve times for defendants and seven times for plaintiffs. All but two cases were for US federal courts; I have also testified and been cross-examined before a European ITC Tribunal, and I worked on an arbitration case before JAMS. I have been deposed four times and testified in court twice. I have been retained as a non-testifying expert in nine patent-related cases: eight times for defendants and once for a plaintiff. I have been retained for nine contractual disputes; five times for defendants, and four times for plaintiffs.

Three cases required me to provide expert opinion on IP related to electronic hardware as well as software. I have written expert reports and declarations for five clients, some cases requiring multiple reports. I have also written declarations, including two for *inter partes* patent review petitions and one pertaining to a Covered Business Method (CBM) for a patent of a financial nature. Eight cases have required me to examine source code, and five of them required me to provide my expert opinion on whether IP theft or copying had likely occurred. Two cases have required that I opine on whether significant IP had been generated.

I have been retained as a software expert regarding the following cases.

- *Alleged Software Misappropriation July 2023 to present*
  Under protective order. Retained by defendant. Currently performing research and interacting with the client. I expect to write a report and testify in Texas.

- *JAMS Case May 2022 to December 2022*
  Retained by Tucker Ellis on behalf of the arbitration respondent, a web application design and development contractor that was sued for alleged non-performance. Analyzed a bespoke financial web application, written in TypeScript for the .NET framework, which used GraphQL, React, React Router, Webpack, Node, Express, PostgreSQL, and Open Layers. Analyzed the project history by examining the git repository and Jira issue tracking system. Developed Jira custom reports.

- Sep 2018 to Dec 2018, then Dec 2019 to March 2020 *BrandRep, LLC and BrandRep Holding, LLC v. Chad Ruskey, Deirdre Mammano, Employer Advertising, LLC, and Business Solutions, LLC C.A. No.: 2018-0541-VCG* - Retained by the plaintiff through Benesch, Friedlander, Coplan & Aronoff LLP. I was deposed for the Delaware Court of Chancery. The matter involved an alleged misappropriation of trade secrets and IP theft. Reviewed Ruby on Rails source code, Java / Spring Boot source code, git logs, Pivotal Tracker logs; performed fuzzy matching and reported on findings. Performed statistical analysis of findings prior to developing an opinion.

- Dec 2016 *Strategyn, Inc., et al. v. James M. Haynes, et al.*, Case No. CGC-15-544093 in the Superior Court of California, County of San Francisco. Retained by plaintiff through Kilpatrick Townsend & Stockton, LLP as a consulting expert and possible testifying witness. The matter involved an alleged misappropriation of trade secrets. Reviewed Ruby on Rails source code and reported on findings. The case settled shortly thereafter.

- Jul 2014 to Sep 2015. *Personalized Media Communications, LLC v. Amazon.com, Inc. and Amazon Web Services, LLC*, civil action no. 1:13-cv-1608-RGA in the district of Delaware. Retained by defendants through Knobbe, Martens, Olson & Bear, LLP to provide expert declarations in support of claim construction briefing. The complaint alleged that the defendant's products infringed PMC's fundamental targeted broadcast and signal inventions. I worked with patent counsel regarding technology disclosed in US patents US8046791 and US7805749. I was deposed on both of my declarations in support of two *inter partes* review petitions, which were successful.

- May 2014 to Nov 2014. *Grant Street Group, Inc. v. Ipreo Holdings LLC.* Retained by defendant Ipreo through Dentons US LLP as an expert witness in a patent-infringement lawsuit in the Western District of Pennsylvania, civil action no. 2:14-cv-321-MRH. The case involved online financial transactions, namely competitive primary-market sales of municipal bonds and notes. I submitted declarations in support of claim construction briefing and a successful *inter partes* review, worked with patent counsel regarding technology disclosed in patent US7523063, and provided support on other aspects of the case; including invalidity analysis, and a CBM that was not filed because the case was settled just prior to filing. Technology: website built using Perl.

- September 2013 to May 2014. *Publicis Groupe Holdings BV v. SAP France*. Retained by defendant SAP through Drinker Biddle & Reath of Philadelphia, PA to testify in Paris, France as an independent expert in a matter before the International Chamber of Commerce, International Court of Arbitration involving a large-scale ERP software implementation project. Wrote two expert reports and collaborated on a joint expert report along with experts retained by plaintiff. As the Lead of seven experts retained by my client, I provided live testimony before the arbitral tribunal, including direct examination and cross-examination, and participated in question and answer session with opposing experts retained by plaintiff. Technology: Adobe Flex and various SAP products.

- September 2013 – *MySpace, Inc. and Craigslist vs. Graphon Corporation*. Retained as a non-disclosed expert by the testifying expert in the consolidated cases C 10-00604 EDL and C 10-01156 EDL. Reviewed the source code of Google Maps in a clean room (C++ and JavaScript) and responded to specific questions by phone.

- Summer 2012 – *Adobe Systems Incorporated v. Wowza Media Systems, LLC*. Retained by plaintiff Adobe through Latham & Watkins LLP of Los Angeles, CA as a non-disclosed expert in patent-infringement lawsuit in the Northern District of California, civil action no. cv-11-02243 cw. The case involved alleged networking patent infringement for Adobe's RTMP family of protocols and the encrypted variant in particular, RTMPe, as disclosed in patents US7272658, US7587509, US7961878, US8051287 and US8065426.

- Spring 2012 – *Confidential – settled out of court*. Retained as a testifying expert through Lewis and Roca LLP of Las Vegas, NV on behalf of the defendant in a matter involving a non-competition clause in an MOU that granted marketing and sales rights for products jointly developed by hardware/software firms. At issue was whether the plaintiff provided valuable trade secrets to the defendant in exchange for royalties paid.

- Fall 2011 – *OpenWave v. Apple Inc.* Retained by defendant Apple as an undisclosed expert through Gibson, Dunn & Crutcher LLP of Los Angeles, CA for an International Trade Commission complaint *In the Matter of Certain Devices for Mobile Data Communication, Docket No. 337-TA-809*. I analyzed two patents (US6289212, US6405037) from a hardware and software point of view, submitted analysis, and searched for prior art.

- Summer 2007 – *Lucent Technologies Inc., v. Gateway, Inc.* (S.D. Cal) Retained by defendant Gateway through their attorneys Dechert LLP of Mountain View, CA as a non-testifying expert in the matter of an alleged patent violation. My work during the 1970s with the communications protocol known as Telidon (the precursor to NAPLPS) was relevant; as was my experience designing programming interfaces (APIs.) Researched additional prior art for the patent defense and wrote an expert report.

- May to Oct 2007 – *FlashFind Corporation v. Continental Graphics Corporation and The Boeing Company*. Retained by defendants Boeing through Andrews & Kurth LLP of Houston, TX as a non-testifying expert in a contractual dispute before the American Arbitration Association, case number 4:2006cv02739 in Texas Southern District Court.

- 2006 – *Visto Corporation v. Sproqit Technologies, Inc.* (case no. C 04-0651 EMC, N.D. California) Retained by defendant Sproqit as a non-testifying expert through their attorneys Dorsey & Whitney LLP of San Francisco, CA. Worked closely with one other software expert in a patent litigation. The defendant's entire staff had been dismissed so, in their absence, we had to figure out what they had developed, and then contrast it with the claims made by the plaintiff. We were able to reconstruct clients and servers (written in C and C++ and running on Windows 2000 Advanced Server and Windows XP), and I assisted with documenting the system.

- August 2006 – *iSmart International LTD v. i-DocSecure, LLC et al.* (N.D. Cal.). Retained as a testifying expert by plaintiff iSmart through their attorneys Sedgwick, Detert, Moran & Arnold LLP of San Francisco, CA. My report offered my opinion as to whether or not the defendant had misrepresented ownership of copyright. I analyzed software source and object code, written in a variety of languages for Microsoft Windows.

- 2005 – Retained by Fenwick & West of San Francisco on behalf of the (confidential) plaintiff, a software vendor that suspected a former employee of intellectual property theft. Reverse engineered the former employee's product, written in C# (a .NET language) and compared it to the client's product, written in C. Compared features, user interfaces, programming interfaces, data structures, static models and run-time models. Advised that there was likely no infringement and the client did not pursue the matter any further.

- Winter 2004/05 – *Teleshuttle Technologies, L.L.C., et al. v. Microsoft Corporation and Apple Computer, Inc.* (case no. 5:04-cv-02928, N.D. California). Retained by Apple as a non-testifying expert through their attorneys Kirkland & Ellis LLP to research prior art.

- 2004 – *Melnyk et al. v. Consonus et al, Case No. 2:03-CV-00528DB*. Retained by the defendant Consonus (a subsidiary of Questar Corporation) as a software expert to render an opinion as to the type and nature of the proprietary technology developed by the plaintiffs prior to the merger that formed Consonus, Inc. Wrote a report, was deposed and testified in federal court in Utah; worked with Jones Waldo Holbrook & McDonough PC. Technology: website development processes with custom tooling.

- 2001 – *Caraligent, Inc. v. TCS America*. Retained by Kirkpatrick and Lockhart of San Francisco, CA on behalf of plaintiff Caraligent as a software expert to evaluate performance of an offshore contractor for potential litigation. Developed metrics and UNIX scripts to quantify software quality deficiencies. My report documented clear evidence that contractor's work was substandard. Technology: EJB (Enterprise Java Beans)

# PROFESSIONAL EXPERIENCE

My GitHub account currently has about 400 projects that I created or took over stewardship of, some of which are described later in this document.

**Andre's Foods**                                                                                    **2007**
*CEO and Co-Founder*

Andre's Foods later became Daiya Foods, a manufacturer of non-dairy cheese, sold to Otsuka in 2017 for $325.5M USD. I introduced a focus on filling semi-trailers full of product for delivery to paying customers.

**Micronautics Research Corporation**                                        **June 2006 to Dec 2020**
*Founder, Distinguished Engineer*

Authored several courses on the Scala and Java programming languages, containing over 200 video lectures, which I produced myself. Delivered courses in person to classes on site and recorded courses so they could be accessed by online students using Cadenza™. Course material included data structure design, concurrency, distributed processing, Scala/Java interoperability, functional programming, and object-oriented programming.

Performed technical due diligence for investors and technology product companies that wish to prepare for investment or sale.

Designed and implemented Cadenza, a web application for authoring and delivering online training. Cadenza is written in Scala; and uses Play Framework 2, the Slick database interface, the Akka concurrency library, the PostgreSQL database, Twitter Bootstrap for the user interface, and is integrated with PayPal. Cadenza is designed as a 'white label' product so it can be branded by customers. ScalaCourses.com is a publicly available website that is powered by Cadenza.

Authored `web3j_scala`, an idiomatic Scala wrapper around the popular `web3j` library for Java. Collaborated on `sbt-ethereum` and related projects; the project currently has 82 stars and 22 forks on GitHub. Authored `ExecutorBenchmark`, which was featured by InfoQ and has 39 stars and 18 forks on GitHub.

Designed and implemented an artificial personality simulator plug-in for artificial intelligence software ("EmpathyWorks") using Java 6, and created a web-based demo. Designed a domain-specific language (DSL) including a custom parser, code generator, and runtime system. The implementation made extensive use of closures and generics. One version of the configuration utility used Adobe AIR. Created two forms of web demo, one using a custom-built internal web server, and another that integrated as a J2EE web application. Wrote the technical documentation in Javadoc and wrote the unit tests using JUnit 4. Set up the Apache 2.0 web servers with Tomcat 5.5 and MySQL 5 on Linux v2.6 servers. Subversion was used for source code management; Ant and Eclipse were used for programming and debugging;

Designed and managed development of sound effects library for a low-cost, embedded integer DSP for the toy and game industry. Designed and automated software engineering process, including

configuration management. Later took over software development and shipped working demo of v1.0 of the product. Used C and assembler to program a 16 bit DSP; interfaced with a 12 bit A/D and a 16 bit D/A.

## Borland Software Corporation                                      March 2005 to August 2005
*Sr. Product Marketing Manager, Delphi, .NET and C++*

Product marketing manager for Delphi; also explored additional opportunities in the Windows and .NET development market. Left shortly before Borland publicly announced they were exiting the IDE market and selling the IDE business, at which time the CEO resigned. Later rehired under contract, after a reversal of the decision to exit the IDE business, to assist with the product marketing of their new Ruby on Rails IDE ("3rd Rail".)

## Zamples, Inc.                                                    Nov 2000 to February 2005
*Founder*                                                                    San Mateo, CA

Developed the first web-based live code example platform; founded startup to address a new industry category, which has since become commonplace. A favorable review of an early version appeared August 2001 on the IBM developerWorks website. Wrote business plan; solicited advisory board; performed market research; specified product specifications; wrote initial software; managed development process and other developers; involved in sales. Contributed the majority of financing, obtained additional financing from friends and family. Initiated the filing nine patents.

## NextSet Software, Inc.                                              Jan 2000 to Sep 2000
*Technology Auditor and later VP Product Management*                           Palo Alto, CA

Retained to perform technical due diligence on a company that was being considered for acquisition, which was merged with NextSet following my report. Became VP Product Management and assisted with the filing of four patents.

## Consultant and Contractor                                            June 1999 to 2012

Consulted in the areas of software product management, technical marketing and software development. Facilitated the development of a total business / technology concept, integrating business strategy with technical strategy. Specialized in the pairing of client/server application development using Adobe Flex, and Enterprise Java-based servers. A variety of remoting technologies are employed, including BlazeDS.

Projects include:

- Designed and developed open source projects, hosted on Heroku, Amazon Web Services, and Digital Ocean; which integrated git repositories such as GitHub and BitBucket using post-receive hooks with Amazon's S3 service. Written in Scala and Play, using Scala and Java libraries.

- Designed and developed a pub/sub facility for Bookish, LLC based on Akka using ZeroMQ; written in Scala and running on Linux. (Today this architectural style is known as *event sourcing*, a form of distributed system.) Later re-implemented using native Akka remoting and added journaling, then split the client-specific code apart from generic code so the project could be made open source. Wrote unit tests with ScalaTest and Akka TestKit. Also wrote an SBT plug-in that displayed all dependencies and their versions, and an SBT enhancement that allowed multi-project builds to be versioned and tagged. Adapted Java-based Nagios status reporting project to Scala, and converted it to use HOCON. Provided pull requests for Akka, ZeroMQ Java binding, and xsbt-start-script-plugin. Created several open-source projects on GitHub.

- Created an open-source Scala project using the BlueEyes framework, Netty, and Akka Actors. Software tools include SBT, IDEA 10.5 and 11, and Scala IDE 2.0. The project was hosted on GitHub[1] and ran on Heroku. The project is a simulation of the adage that a large number of monkeys typing long enough should eventually reproduce any given document. It demonstrates techniques for horizontal scaling of computationally intensive tasks, and an efficient mechanism for gathering and summarizing partial results.

- Interim VP Engineering for startup; the software company was acquired by a non-technical investor and lost its entire staff during the transition. Their health care product assisted the scheduling of medical specialists in hospitals. I interviewed the last two employees before they left, instituted engineering processes that relied heavily on git, documented the system and managed contractors. Technology: Flex 3 and 4 hybrid, BlazeDS 4, git, Spring 3, Hibernate 3, ActiveMQ, Camel and PostgreSQL 9. Managed programmers in USA and Eastern Europe. Proposed a rules-based automated scheduling feature and built prototype. Debugged Voxeo IVR scripts, CellTrust SMS configurations, hardened the Tomcat / BlazeDS server.

- Performed technical assessment of a Flex project outsourced by a Malaysian telecom company to an Indian company. Provided technical support to both companies, and evaluated risks and costs for possible outcomes with client in an attempt to rein in a project gone bad.

- Wrote a commercial Android application using Eclipse. Application used voice recognition and text-to-speech.

- Brought in on an emergency mission at The Nielsen Corporation to assist with integrating a Tibco AMX server with an outsourced Flex 3 project that had gotten into trouble. Originally brought in to solve a specific problem within a six-week period, I was asked to stay over five months. Redesigned and re-implemented the web services layer for a Cairngorm implementation as a generic library which was compatible with pre-existing Flex 2 projects. Refactored the web services layer so that implementation details were placed in a separate project and developed a testing framework. Trained Nielsen personnel so they were able to update the web services layers on their legacy projects. Assisted Tibco and Nielsen technical staff to redesign and troubleshoot WSDL. Assisted Tata Consulting Services and Nielsen technical staff with their Flex design,

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[1] https://github.com/mslinn/hanuman

implementation and test facilities. Wrote a WSDL introspector in Adobe AIR that generated value objects, value object references, and service delegates from WSDL. This tool was used many times to regenerate the service layer as WSDL changed throughout the project; see slideshow[2], accompanying YouTube video[3] and video update[4].

- Extended the MicroStrategy Visualization Flex framework for eBay, MicroStrategy's largest customer. I added curve fitting routines (linear, polynomial, and power law), interactive pruning of outlying data points, and custom analysis abilities. I added the ability to remotely browse files on server so user preferences and report settings could be stored and retrieved from a PHP server. I provided the ability to copy computations onto the system clipboard so they could be pasted into Excel, developed custom components that responded to derived models, and provided the ability to copy computations onto the system clipboard so they could be pasted into Excel.

- Rearchitected a Spring application that used Java Swing for the GUI and ActiveMQ for distributed messaging. Transformed it into a client/server application using Adobe Flex, BlazeDS, Tomcat and ActiveMQ;

- Mentored the CTO of a startup (Clientshow) who was architecting a Flex-based presentation platform for creative professionals using AIR, MySQL, BlazeDS, ActiveMQ, and CentOS;

- Developed a prototype user interface using Flex for a client/server financial application; assisted the server team with JBoss Portal Server integration;

- Mentored the development team at a small health care software vendor and assisted them in transforming their HTML-based server product into a client/server application based on Flex, BlazeDS, and Tomcat;

- Designed and partially implemented an open source marine navigation and mission control system for an autonomous (robotic) boat project at Willow Garage Inc. in 2008. Designed GUI with novel control features; wrote software in Python v2.5.2 using PyGTK v2.10, PyCairo v1.4.12 and Glade v3.4.1 on Ubuntu Linux v7.10; read S-57 vector charts using GDAL v1.4.1, Google Earth KML data, and GPX data using LXML; interfaced with remote instrumentation via an Internet Communication Engine (ICE) bus. Wrote and edited documentation for the technology stack under a Creative Commons license. Assisted another electronics engineer with NMEA 2000 device integration. Project was canceled before completion;

- Several engagements with different investment bankers regarding investment opportunities and trends in the software tools market;

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[2] http://www.slideshare.net/mslinn/using-flex-with-enterprise-web-services

[3] http://www.youtube.com/watch?v=ubuq79GDhQw

[4] http://www.youtube.com/watch?v=YzSoweoormg

- Implemented a graphics application in C++ on Win32 using OpenGL and created an engineering prototype of a child's toy. The toy tracked a light beam and used a color projector connected to a microprocessor so that a child could use a wall as a drawing surface without marking on it;

- Contributed many open source installation scripts for Gentoo Linux;

- Retained by EzRez Software to design and implement a means of discovering and documenting software interdependencies on demand. Developed innovative new technology in Java 5 that reduced the reliance upon key technical personnel. The solution that I proposed and implemented was to custom-build a technical publishing system that used a Wiki as a distributed authoring tool, and an analysis engine that correlated product features to bug reports and customer usage of those features. The client uses the solution for documentation and risk mitigation. Using this tool, they are able to readily identify which customers use a given feature, the software components that provide that feature, and how fragile that feature is; by correlating bugs to the components that enable the feature. I worked directly with the CEO and VP Engineering to incorporate the tool into the development process. I used a variant of Docbook and wrote a custom XSL processor that enabled publishing to a variety of media. Also advised senior management and the chairman of the board on strategic issues;

- Retained by the Muks-Kum-Ol Housing Society of Terrace, British Columbia to prepare a response to an RFQ for distributed health care information services. Muks-Kum-Ol is a member of the M'akola Group of Societies, the largest Aboriginal affordable housing provider in British Columbia. Performed requirements analysis, prepared product specifications, architectural designs, estimated time and budget, and co-wrote the document with a health care practitioner;

- Assisted in the development of numerous business plans for startups;

- Investigated potential investment opportunities for Crosslink Capital in the areas of enterprise application integration (EAI), web services, and Java-related technology; provided technical briefings; performed technical due diligence for acquisitions and investment for private investors;

- Contributed to the documentation for Tomcat, Sun Microsystems' open source reference platform for Java servlets;

Sample clients are listed below.

♦ **Data Communications Ltd.**                                                         **Mar 2000 to Sep 2000**
   *VP Engineering (Contract)*                                          **San Francisco and Hong Kong**
   Data Communications Ltd. was a Hong Kong startup founded in March 2000 by internationally renowned radio consultants. I assisted with the development of a business plan and technical strategy, designed Internet-based architecture, oversaw proof of concept, assisted with the definition of the corporate structure, and developed the concepts for the filing of four patents before funding gapped.

♦ **Data Kinetics Ltd**                                                      **Oct 1999 to Jul 2000**

*Technical Business Strategist and Systems Architect (Contract)*             **Ottawa, ON**

Data Kinetics is a Canadian company that has provided enterprise level software solutions and products to Fortune 500 companies since 1978. I consulted with the client's senior management and senior technical staff regarding their desire to present a proposal to the US Congressional Advisory Commission on Internet Taxation. Acted as the focus group's leader, oversaw the development of a business strategy relying on developing new Internet standards, and defined a hierarchical architecture for worldwide collection and administration of taxes via the Internet. The client's technical staff then began work to integrate their proprietary products into the architectural framework. Prepared the technical components of the proposal that Data Kinetics presented.

♦ **Transium Corporation**                                                   **Jun 1999 to Aug 1999**

*VP Engineering (Contract)*                                                  **Los Altos, CA**

Transium (later sold to AltaVista, then sold to Yahoo!) was a ten-person startup that performed full-text indexing of client content, and normalized disparate data feeds and forwarded them to client's web servers.

- Designed and implemented a corporate intranet and an extranet using IIS 4.0, Visual Interdev and FrontPage, and wrote most of the content (approximately 35 pages).

- Performed system administrator functions (set up a Windows NT domain and administered network users, installed anti-viral and defragmentation software, set up Windows NT Enterprise 4.0 with MTS, MSMQ and SQL Server 7.0 on four machines.)

- Supervised four Visual C++ programmers working with NSAPI and lead the port to ISAPI from NSAPI

- Completed the programming of a billing system that implemented an XML interface using MSXML

- Designed and supervised the implementation of a C++ ADO interface to SQL Server. Designed the database, wrote most of the system documentation and was the main technical customer contact for the billing system.

- Implemented a bug tracking system using ASP pages running on the extranet.

- Played a key role in technical marketing discussions

♦ **@Court, Inc.**                                                           **Jun 1999 to Aug 1999**

*Software Architect (Contract)*                                             **Alameda, CA**

@Court was a two-person startup that hoped to allow law courts to accept legal documents from attorneys over the Internet. I designed and implemented a prototype for demonstration purposes so that potential investors could appreciate the concept. The system was written in ASP and used ADO to connect to an Access database in a transactional manner.

**The Dialog Corporation**                                    **Nov 1998 to May 1999**
*Senior Architect*                                                **Mountain View, CA**

Dialog Corporation, spun off from NASA in 1969, was the original online information provider; with approximately nine terabytes of information in legal, business, news, patent and pharmaceutical information. Dialog is now part of the Thompson Publishing Group.

Was the middleware architect for applications running under IBM VM, DEC OpenVMS and IBM OS/390. Led an initiative for an object transaction monitor, with a forward view to Enterprise Java Beans. Authored the technical requirements, initiated vendor relations and defined the process to determine the selection criteria for the transaction monitor. Played a role in establishing the other subprojects for the new enterprise-wide billing system and next generation information delivery products.

Acted as a process engineer, and implemented relevant aspects of PMI, SEI CMM and ISO 12207.

Wrote several white papers that describe how to use object-oriented technology to 'wrap' Dialog's legacy mainframe applications for use by CORBA-based application servers. Wrote a brief application note that describes how to use Microsoft IIS to set up templates for accessing Dialog's online information from a client's intranet.

**Consultant and Contractor**                                          **Vancouver BC**
                                                                        **1994 to 1998**

Internet software developer; designed programmable, database-driven commercial Websites. Platforms included IBM OS/390, Windows NT and UNIX using C++ and Java. Also provided technology evaluations, strategic planning and internationalization consultation.

♦   Personal website was originally programmed using SMX (a language from the now-defunct Internet Factory). Later reprogrammed the website using ASP and an ISAPI extension that I wrote (WebContact) and an ATL component (MseUtils) that I wrote. A later version of website was implemented using Java Server Pages and Java classes.

♦   January 1999: Did a technical review of "Enterprise Java Beans" by O'Reilly and Associates (prior to the book being printed.)

♦   October 1998: Did a technical review of "Java Servlet Programming" by O'Reilly and Associates, and contributed much of the material in the book that contrasts JSP and ASP.

♦   Summer 1998: Paralogic Software Corporation - Assisted in the development of the world's first Java chat server running on Sun Solaris and FreeBSD (wrote Java and C shell scripts, using CVS). Also assisted in the marketing efforts by writing marketing collateral and attended client's Comdex Enterprise booth.

♦   March – May 1998: Participated in the Microsoft Site Server 3.0 Beta program. Used Site Server to prototype a website proposal for the Seattle Mariners. Product features utilized: Personalization and Membership, E-Commerce pipeline, ad campaign management and staging. Acted as the project manager and team lead. The team did extensive market research, and mockups were produced in English, Spanish and Japanese. The Mariners decided not to pursue the project.

- February 1998: Continued a ten-year association with IBM by executing proof of concept projects. Example: Contracted to IBM to convert the Insurance Corporation of British Columbia's intranet from IIS and Access to Lotus Domino Go using DB/2 on UNIX 95 running on OS/390.

- January 1998: Set up Sunshine GM's IIS-based website using ASP. The site allowed the sales manager to upload new images of used cars easily and describe their inventory. Used CDONTS to send faxes to sales people when users clicked on cars that they were interested in, and wrote ASP functions to make it easy for the sales manager to add inventory. Non-sensitive user information was stored in cookies.

- April/May 1998: Designed and deployed ASP-based website using SQL Server, developed marketing collateral for NCompass Labs, Inc.. Was the first person to use their new 'Resolution' product to create the website. Interfaced with the President, VP Sales, CFO, VP Technology, graphic artists, programmers and customer support representatives. This project had extremely short deadlines, but was completed on time and under budget. Trained and mentored dozens of staff. NCompass Labs is now part of Microsoft.

- 1998: Sold five technical articles to Sun Microsystems for their Java website (`http://java.sun.com`.) Topics included internationalization, JavaBeans, CORBA, and two human-interest pieces.

- Winter 1997: Wrote an ATL COM component in Visual C++ to extend ASP. It is based on an earlier generation of programmable NT based-web servers by The Internet Factory. Assisted in the development and technical documentation for that product in 1995.

- Spring 1997: Wrote an ISAPI extension in C++ for Microsoft IIS web servers for sales automation. "WebContact" was a rule-based sales lead distribution mechanism designed for large enterprises or companies with many products feeding a large distribution system.

- January 1997: Wrote a JavaScript guessing game as part of a non-profit organization's site that I had built.

- Fall 1996 - summer 1997: Used SMX and JavaScript on several contracts, including programming an auction site (`http://www.maynards.com`), a distribution firm and several adult sites. All sites incorporated ODBC-compliant databases such as Access and SQL Server.

- December 1996: Evaluated Microsoft's ASP against Site Magic (SMX) for The Internet Factory.

- August – October 1996: Prepared documentation and performed software development for The Internet Factory's SMX programming language; helped in their booth during Fall 96 Comdex.

- 1995 – Mentored a group consisting of BC Systems staff and University of Victoria graduate students, assisted with the formation of and guided the first year of what became PureEdge Solutions, Inc. (later sold to IBM).

- June 1994 – December 1995: Designed website and wrote Cold Fusion web pages that accessed a Sybase database for an online information provider. Contributed to analysis of customer needs, evaluated software alternatives, designed file structures and naming conventions. Trained staff that grew the website to hundreds of pages.

♦ January - May 1994: Sales agent for BorderWare firewalls, worked with various Internet startups in Vancouver, BC.

## M. Slinn Engineering Services Inc.                           1982 to 1993
*President and VP Product Management*                           **Vancouver, BC**

The company was an Authorized Third Party Software Developer for AutoCAD and 3D Studio.

Growing from one person to ten, the company developed and marketed eleven proprietary software products internationally in the areas of earth science, mechanical engineering and cartography. Products were produced in English, French, German and Spanish, for DOS, Windows, UNIX and Macintosh.

♦ 1986 –1991: Collaborated extensively with multidisciplinary network of people in the fields of geology, mine engineering, cartography, ship design, packet switching, control systems, UNIX internals, mathematics, kinematics and advanced surface modeling. Hired five permanent staff plus six contract staff including marketing consultants, contract programmers, graphic artists and clerical staff. Products included:

- C-Line – this family of products provided the ability to draw complex lines, containing symbols, letters and dashes. C-Line, captured over 90% market share, and over 4,000 copies were sold at $295 to $595 each.
- InterPoly – interpolated a smooth path passing through a set of points, which could be divided into equally spaced segments
- AutoSpline – interpolated a spline from a set of points, with variable 'tension' to draw tighter or looser splines
- CADMatrix – a 3D extension for rotation and translation of 2.5 AutoCAD models
- AutoDrill – a 3D modeler for visualizing and planning borehole paths through underground bodies
- AutoMiner – a 3D modeler for visualizing the geometry of underground ore bodies and mine shafts. Of particular interest was the volumetrics capability, which computed the amount of ore and waste material.
- 3DTM – a 3D terrain modeler for open pit mining and civil engineering. Of particular interest was the volumetrics capability, which computed the amount of ore and waste material.

♦ 1988 - Wrote display software in C for Ontario Hydro using a programmable Pepper Pro video board for a non-contact nuclear boiler inspection system. The system was very fast because the video card's processor was much more powerful than the 80386 used in the Compaq computer that ran the control system.

♦ 1987: Managed a team that developed a generic voice response tele-order system.

♦ 1985-1986: Owned and operated a retail computer firm in association with the IBM Product Center; selling and supporting GKS, AutoCAD, Lattice C and XENIX from 1985-86; was an authorized AutoCAD dealer during this time.

- ♦ 1985-86: Performed technical due diligence for Davidson and Company for several companies about to IPO on the Vancouver Stock Exchange. The best-known company is 3D Systems, which invented the first stereolithography system.

- ♦ 1983: Programmed and tested the switching software for Microtel Pacific Research's Spacetel service.

- ♦ 1982: developed and marketed GRENGINE, one of the first CAD programs available for a microcomputer. It ran on the HP 9000 family.

### British Columbia Institute of Technology                          Winter 1987
***Computer Science Instructor***                                    **Vancouver, BC**

Taught junior students *Introduction to Computers*; supervised senior student projects; lectured senior students on Advanced Microprocessors.

### Nabu Manufacturing Corp                                          1981
***Contributing Project Manager***                                   **Ottawa, ON**

Nabu developed a cable-ready PC for under $1000 in 1981. Defined system architecture, supervised the logic design, PC layout and assembly line production of *The Games Board*, an S-100 card. Features included video and audio generators, game paddles and joysticks. Wrote a CPM-compatible operating system that booted off a cable modem, developed software tools for game programmers. Turned a business computer into a platform for video game software development. Designed and implemented hardware and software to emulate a Gould SEL Concept/32 CATV head end processor.

### Carleton University                                              1980
***Sessional Lecturer***                                             **Ottawa, ON**

Prepared and delivered *Introduction to Computers* lectures, teaching materials and exams under the guidance of the department head. Taught PDP-11 assembler with emphasis on structured programming.

### Bell-Northern Research                                           1980
***Member of Technical Staff (Software Engineer)***                  **Ottawa, ON**

BNR was the research and development company for Northern Telecom and Bell Canada. Was a software engineer for Northern Telecom's Text Messaging System and a member of the Software Tools Department for Datapac.

### Thundering Herd Consulting Inc                                   1978 – 1980
***Founder & President***                                           **Ottawa, ON**

Technical software development and systems integrator; six-person company. Clients included Mitel, Bell-Northern Research, Bell Canada, Northern Telecom and Telecom Canada. Responsible for overall project supervision, project management, manpower and resource acquisition, and allocation, marketing, and programming. Projects included:

- Graphical analysis of the Digital Radio System (DRS-8). Interpreted programming requests from a team of scientists and engineers for statistical error analysis, including correlating weather data to digital radio fading characteristics
- Performed system design and software development of the human interface for the Telidon Information Provider System and NAPLPS terminal for their parent company Bell Canada.
- Maintained Mark IV databases for Bell Canada's marketing group and wrote custom queries on IBM mainframe.

## CERTIFICATIONS

Accredited as a Professional Engineer by the Association of Professional Engineers of British Columbia in 1985. Allowed membership to lapse in 2003 after having emigrated to the US several years previously.

Adobe Flex 3 with AIR ACE (ID #ADB222533) – accredited as an expert by Adobe in 2009.

## OPEN SOURCE CONTRIBUTOR

216 public projects on GitHub, including:

### Django-Oscar – 2021-2022

Expanded the Django project and app templates to support Django-Oscar.

### Jekyll Plugins – 2020 - 2022

Wrote 20 open-source plugins for Jekyll (a static website generator), and published blog posts about them. The plugins are available on RubyGems.org.

### Ethereum – 2017 – 2020

Created `web3j-scala`, an idiomatic wrapper around `web3j` (a popular Ethereum library for Java). Collaborated on `sbt-ethereum` and related projects. Created `cli-loop`, written in Scala and featuring multiple concurrent subshells (interpreters) for JavaScript, Ruby, Python, Java, Scala, Ethereum and JavaScript.

### Amazon Alexa – 2017

Rewrote portions of the *Alexa Cookbook* and copy edited the entire document.

### Event Sourcing and CRDTs – 2017

Rewrote and updated Martin Krasser's `eventuate` sample programs and accompanying documentation.

### Apache Spark – 2016

Rewrote the Databricks Spark-Twitter-Lang-Classifier reference application and updated it from Spark 1.4/Scala 2.10 to Spark 2.0/Scala 2.12. Assisted with updating the other Java and Scala reference applications.

### Play Framework and related – 2012-2020

Wrote `PFView`, `Play-Access-Logger`, `Scalacourses-Play-Utils`, `Urlettes`, `Html-Form-Scala`, `Has-Value`, `Has-Id`, `Play21-Template`, `Play22-Template`, `Play23-Template`, `Play24-Template` and `Play25-Template`, `Hanuman`. Contributed improvements and/or documentation for Play Framework, `Play-Silhouette`, `Play-Silhouette-Seed` and `WebJars`.

### Scala Language and related – 2011-present

Wrote `git-stats-scala`, `hacker-rank`, `quill-cache`, `quick-gen`, `Scalacourses-Utils`, `Square-Api-Facade`. Bug reports and improved documentation. Contributed code and/or documentation to `Better-Files`, `Commander-Scala`, `Currency`, `ScalaPB`, `Typesafe Config`, `SBT`, `SBT-Native-Packager`, `Dependency-Report`.

### Akka related – 2011-2020

Wrote `TestPublishApp`, `TestPublishLib`, `AkkaFilter`, `AkkaSampleRemote`, `ZeroMQ-Scala-Binding`.

### AWS related – 2011-present

Wrote `AWS-Lib-Scala`, `Cracker`, `PVideo-Shared`, `AWSMirror`, `GitS3Glue`. Updated *Alexa-Cookbook* docs.

### Java – 1997-present

Contributed to the documentation for Tomcat, Sun Microsystems' open source reference platform for Java servlets.

### Miscellaneous – 2011-present

Wrote `PushToNagios`, `Barcode`, `Meetup-Roll`. Contributed documentation to `Hazelcast-Scala`.

# EDUCATION

Bachelor of Engineering – Carleton University, Ottawa, 1979.

- Major: Electronics.
- Minor: Computing Systems.
- Thesis: "ARP-EM" A Real Time Digital Music Synthesizer (Software simulated an Arp 2600 synthesizer implemented in assembler on a dedicated PDP11/45). Software featured a graphical user interface, real-time sampling, and digital signal processing.

Accredited by the Association of Professional Engineers and Geologists of British Columbia (APEGBC) as a Professional Engineer. Did not maintain my status or apply to the equivalent US association for P.E. status after emigrating to the US.

Ongoing professional development in the areas of software-business models and technology, project management, and software engineering.

Got a perfect score in "Functional Programming Principles in Scala" hosted on Coursera in 2012.

Attended CANOpen training seminar Mar 2008.


# PRESENTATIONS

***Dotty (Scala 3 Preview)*** at the Lambda Montreal Meetup December 23, 2019. This was the abstract for the 1 hour and 16 minute presentation: Scala 3 is known as Dotty, and is expected to be released in 2020. It features intersection types, union types, repeated by-name parameters, trait parameters, improved lazy val initialization, native support for type classes, compatibility with most Scala 2 libraries, and optional support for syntax similar to Haskell and Python. Michael will present the current version of Dotty and give a demo.

***EmpathyWorks – Towards an Event-Based Simulation/ML Hybrid Platform*** at the Montreal Machine Learning Meetup, November 5, 2019. The abstract for the 22-minute presentation was: Machine learning systems have become the dominant form of AI for enterprises due in large part to years of experimentation with combinations of technical approaches. Today's ML systems are unlike traditional software systems in that algorithms are not used to procedurally specify how systems learn to recognize patterns from input. On the other hand, simulation systems have traditionally been highly procedural, which is good for understanding how a result was obtained, but 'learning' is not normally expected. Mike Slinn will discuss a hybrid approach under consideration based on work he started in 2008.

***Evaluating Blockchain Companies*** at the 6th Global Blockchain Conference, August 29, 2018 in Santa Clara. This was a 40-minute non-technical presentation on how I perform technical due diligence for investors and companies seeking investment. InfoQ Magazine is preparing the video for publication online.

***The Future of Blockchain*** (keynote panel discussion participant) at the 6th Global Blockchain Conference in Santa Clara August 28, 2018.

*How Does a Smart Contract Learn?* for the 5th Global Blockchain Conference, April 2, 2018 Santa Clara. This was a 40-minute technical presentation; InfoQ Magazine published the video online[5].

*Polyglot Ethereum - Smart Contracts for the Enterprise*, at the World Crypto Economic Forum in San Francisco, January 16, 2018.

*Play Architecture, Implementation, Shiny Objects, and a Proposal[6]*, for Scala by the Bay in Oakland, CA, August 14, 2015.

*Scala / Akka Concurrency Options[7]*, for the Bay Area Scala Enthusiasts June 11, 2012

*Composable Futures with Akka 2.0[8]* for the Silicon Valley Web JUG at Googleplex March 21, 2012 and Silicon Valley Code Camp 2012 October 5, 2012.

*SBT, IDEA and Eclipse[9]* (with James Ward) at the SF Scala meetup Nov 21, 2011.

*Introduction to Akka 1.2*[10] at the SF Scala meetup Nov 21, 2011.

*Hanuman – Scala, Akka, Actors, BlueEyes[11]* at the SF Scala meetup Nov 21, 2011.

*The Adobe Flash Platform in the Enterprise* at Adobe headquarters for the Silicon Valley Flex User Group in Sept 2010.

*Using Adobe Flex with Enterprise Web Services*[12] at Adobe MAX 2010 at the Los Angeles Convention Center.  A video[13] and a video update[14] were published to YouTube discussing a subset of the Adobe MAX presentation.  This presentation was also given to the Silicon Valley ACM chapter in February 2011.

Presented a talk about my work as a software expert at the quarterly meeting of the Society of Forensic Engineers and Scientists Mar/2008;

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[5] https://www.infoq.com/presentations/smart-contracts-learn

[6] https://www.slideshare.net/mslinn/play-architecture-implementation-shiny-objects-and-a-proposal

[7] https://www.youtube.com/watch?v=VVScNIvmdUc

[8] https://mslinn.com/articles/books/scalaFutures.html

[9] https://www.slideshare.net/mslinn/sbt-idea-and-eclipse-10278783

[10] https://www.slideshare.net/mslinn/introduction-to-akka-10278739

[11] https://www.slideshare.net/mslinn/hanuman-10278606

[12] https://www.slideshare.net/mslinn/using-flex-with-enterprise-web-services

[13] https://www.youtube.com/watch?v=ubuq79GDhQw

[14] https://www.youtube.com/watch?v=YzSoweoormg

Moderated a panel discussion at Web Services World on behalf of the Silicon Valley chapter of Net Market Makers Apr/2001

Presented at 2000 and 2001 O'Reilly & Associates Enterprise Java Conferences.


# PUBLICATIONS

My blog is at `https://mslinn.com/blog`. Topics include AI, Apache Spark, AWS, bash, blockchain, business, Django, Docker, e-commerce, ECMAScript, Ethereum, e-commerce, git, GitHub, Go, Google, smart speakers, Heroku, Java, JavaScript, Jekyll, JSON, Linux, Media, Nabu, Node.js, open source, PostgreSQL, Python, robotics, Ruby, Scala, scripting, SEO, serverless computing, software experts, startups, technical evaluations, Ubuntu, Visual Studio Code, and Microsoft Windows Subsystem for Linux.

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Remote Testimony

Trust, Winning and Losing as an Expert Witness (republished by the Round Table Group)

Preparation is Everything (republished by the Round Table Group)

What I wish I knew the first time I was an expert witness (Originally a podcast interview by Michelle Loux of the Round Table Group; my original notes were later republished on my web site with the title What I Wish I Knew When I First Started)

What Does 'Control' Mean in 2022?

**Distributed Computing articles**

*Smart Contracts That Learn* (July 2018) feature article for InfoQ Magazine.

*Benchmarking JVM Concurrency Options for Java, Scala and Akka* (April 2012) feature article for InfoQ Magazine.

*Composable Futures with Akka 2.0* (February 2012) 125 pages.

*End-to-End Client/Server Security with the Adobe Flash Platform* (Q1 2011) 22 pages.

*Getting Started with Adobe LiveCycle Data Services ES* (2010) seven-page reference card published by DZone.  A video interview was also made at Adobe MAX 2010 that introduced this material.

*Adobe Flex Data Services, Hibernate and Eclipse* (2010) Authored a 504-page book that covers how to write clients and configure Java servers in enterprise settings using the Adobe Flash Platform.  Products described include Adobe Flex, BlazeDS and LiveCycle Data Services.

**Technical Reviewing (Books)**

| | |
|---|---|
| Jun 1998 | *Java Servlets* by O'Reilly and Associates  (contributed much of the material in the book that contrasts JSP and ASP) |
| Feb 1999 | *Enterprise Java Beans* by O'Reilly and Associates |
| May 2000 | Professional Java Server Programming – J2EE Edition by Wrox Press |
| Nov 2000 | *Professional Java Mobile Computing* by Wrox Press (J2ME) |
| Jan 2001 | *Professional JMS Programming* by Wrox Press |
| Feb 2001 | *Professional EJB* by Wrox Press |
| Mar 2001 | *Professional Java XML* by Wrox Press |
| Apr 2001 | *Java Cookbook* by O'Reilly and Associates |
| Jun 2001 | *Professional XML* by Wrox Press |
| July 2001 | *Java RMI* by O'Reilly and Associates |

**Technical Writing**

Nov 1996     SMX Documentation Suite

Feb 2001     Tomcat documentation

**Editing**

Feb 96     Continuity-edited a 400-page autobiography of a woman coming to terms with her ancestral native spirituality.

**Conference Proceedings**

Slinn, M. and Suresh, A. "[E-Commerce Taxation: A Global Standards-Based Architecture](#)," 2001 O'Reilly Conference on Java. Presented shortly after our group's briefing to the US congressional Internet Tax subcommittee.

Slinn, M "JBrowCaps: Open Source Browser Independent Page Rendering for Java Servlets," 2000 O'Reilly Conference on Java

## Technical Writing (Magazines)

### Practical Sailor Magazine

| | |
|---|---|
| Jul 2006 | *Making a case for a custom-made computers* (reprinted in Power Boats Reports) |
| Aug 2006 | Navigation software review (reprinted in Jan/07 issue of Power Boats Reports) |
| Aug 2007 | *Practical Sailor Test Drives Nobeltec's Admiral 9.1* |
| Dec 2007 | *Head to Head* – marine toilet review |
| Dec 2007 | NavPak Pro software review |
| Sep 2010 | NMEA Multiplexer theory & product review |

### Software Development Forum Magazine

| | |
|---|---|
| Aug/Sep 04 | *Top Ten Issues for Developer Relations Managers* Published in SD Forum's Aug/Sep 2004 newsletter, reprinted in the October issue of the Association of International Product Marketing and Management online magazine |

### MultiLingual Computing Magazine

| | |
|---|---|
| Apr/May 99 | *Top Ten Internationalization Errors* |

### Networking Solutions Magazine

| | |
|---|---|
| Mar 98 | *Java Servlets and the intraNetWare Server* |

### CADENCE Magazine

Only the dates and titles of original publications are listed; reprints in CADdesk and CAD User magazines are not listed.

| | |
|---|---|
| Aug 88 | *Venturing into Technical Publishing: Tips for Using Ventura Publisher* |
| Dec 88 | *Media, Pens and Ink* |
| Feb 88 | *Alternative Shading Software* |
| Jul 88 | *Modeling Heavy Equipment with Release 10: How to make a 3D Model* |
| Aug 89 | *Testing Your Knowledge of AutoCAD (Review of the AutoCAD Evaluator)* |

| | |
|---|---|
| Mar 90 | *AutoCAD R10 on Xenix/386: Is Xenix A Good Option for Your Business?* |
| Apr 90 | *A Less Demanding Setup Can Still Give Users Raw Speed* |
| May 90 | *The Operating System of The Future (OS/2)* |
| Oct 90 | *What About OS/2?* |
| Nov 90 | *Do You Speak CAD? (Issues You'll Face When Translating Between CAD Systems)* |
| Jan 91 | *DOS 5.0: Making It Work* |
| Mar 91 | *CAD/CAM Developer's Kit (Review)* |
| Apr 91 | *Image Processing Product Roundup* |
| Jul 91 | *Tools for the Modern Magician: C Compilers for ADS Developers* |
| Aug 91 | *2001: The Pace of Change* |
| Sep 91 | *AutoCAD Reporting: GIS* |
| Oct 91 | *AutoCAD and Windows* |
| Nov 91 | *More Magic: ADS Tools Multiplying Like Rabbits* |
| Nov 92 | *Adventures in Networking: Connecting Sun SPARC and Macintosh Computers to NetWare* |
| Dec 92 | *Autodesk Boosts Windows Port With Watcom C* |

**CADalyst Magazine**

| | |
|---|---|
| Nov 86 | *Blue Sky: Gazing at the expert system horizon* |
| Jan 87 | *The CAD Cookbook #1 (C-Line I)* |
| Apr 87 | *The CAD Cookbook #2 (Customizing Information)* |
| May 87 | *The AutoLisp Tutorial #5 (External Data Files)* |
| Jun 87 | *The AutoLisp Tutorial #6 (Entity Access)* |
| Jul 87 | *Outside AutoCAD #1: An Introduction to Running External Programs with AutoCAD* |
| Sep 87 | *The CAD Cookbook #3 (Block attribute editing)* |
| Oct 87 | *Outside AutoCAD #2.* (Michael is listed as CADalyst's "Resident Consultant") |
| Feb 88 | *Pen Plotter Specifications* (co-written with Ralph Grabowski) |
| Feb 88 | *The CAD Cookbook #4 (P&ID drawings)* |
| Mar 88 | *Animation for Mechanical Engineers* |
| Apr 88 | *Installing an Engineering Workstation* |
| May 88 | *Creating 3D Models Through Parametrics* |

**Association of Professional Engineers and Geoscientists of BC**

Aug 85    *Input/Output: Manufacturers vs. Consumers*

Oct 85    *Input/Output*

## Public Service

The following articles were posted on mslinn.com from 1994 to 2006 as a public service:

*The Internet and Children: Responsible Parents and 'The Information Appliance'*

*The Internet and Children: Securing Peace of Mind*

*The Electronic Playpen*

# PROGRAMMING EXPERIENCE

Developed embedded software, enterprise software, software tools, desktop applications and server software using:

- Ruby, Ruby on Rails, RSpec, Bundler, gems, Jekyll;

- Scala, Akka, Play Framework, SBT;

- Libraries and tooling for Ethereum smart contracts;

- MicroStrategy Visualization Flex API;

- Adobe Flex, AIR, ActionScript, BlazeDS and LiveCycle Data Services;

- Web 2.0, web services, XML, SOAP, WSDL, CSS, SAX, DOM;

- Java, J2EE, Java Servlets, EJB, JDBC, J2ME, JAXP, Javadoc, Ant;

- Tomcat, JRun, J2EE reference implementations;

- SQL databases: PostgreSQL, MySQL, SQL, ODBC, SQL Server, Sybase, Oracle, Microsoft Access;

- Version control systems: git, GitHub, GitLab, subversion, CVS;

- Non-SQL databases: MongoDB, Mark IV;

- Python 2 & 3, GTK+ and PyGTK, Cairo and PyCairo, Glade;

- C & C++ (numerous compilers);

- FORTRAN IV;

- Assemblers: 8080, 8085, 6802, 6805, Z80, PDP-11, King Billion DMCU (DSP);

- HTML, CSS, Front Page, Adobe DreamWeaver, Microsoft FrontPage;

- AutoCAD AutoLisp and ADS;

- HTTP, RTSP family, SMIL, PGM;

- Microsoft Visual Studio Code, IntelliJ IDEA, Eclipse, Symantec Visual Café, Sun Forte, Pramati Studio;

- Borland JBuilder and JBuilder OpenTools, TurboC, Turbo Pascal, TurboProlog;

- Microsoft Visual InterDev; Microsoft C, C++ and COM; IIS and ASP; Visual Basic; custom enhancements for Microsoft Office and Visual Basic;

## DEVELOPMENT METHODOLOGIES

Although my preference is Kanban, I have used a variety of issue managers such as JIRA and YouTrack, Visio, Microsoft Project and other tools with the following methodologies:

- Waterfall;

- Agile, including Kanban, Scrum and Extreme Programming;

- Rational Unified Process;

- SEI CMM.

## COMPUTER HARDWARE EXPERIENCE

- Custom-built many IBM PCs and a Hackintosh from components;

- VMware Workstation and Player;

- Android and Apple cell phones and emulators;

- King Billion DMCU DSP system on a chip (Harvard architecture);

- S-100 (designed custom daughter boards and attendant software);

- Intel ICE-80 & ICE-85 with Intel Multibus single board computers such as 8020.

## SYSTEM ADMINISTRATION EXPERIENCE

- Have maintained multiple physical and virtualized Linux servers in data centers and at home for decades (ongoing): Ubuntu, XUbuntu, Gentoo 2.4 and 2.6, RedHat 7.3 and 9, SuSE 7.3;

- Networks of Windows 10 / 7 / XP / NT / 95, Windows for Workgroups, Windows 3.1, DOSes;

- Cygwin and Git for Windows;

- Novell Netware;

- Sun O/S (various versions);

- SCO XENIX;

- Amazon Web Services products.

## OTHER OPERATING SYSTEMS USED

- CP/M;

- DEC VAX VMS, RSTS/e, RT/11;

- Xerox Sigma 9;

- IBM 1620, IBM 360/168 and OS/390 operating systems: JCL, VM, CMS.


## SOFTWARE USER EXPERIENCE

- Adobe Premiere Pro, PhotoShop, Illustrator, InDesign, Media Encoder;

- Microsoft Office; I also write custom macros, some are advanced;

- Techsmith SnagIt, Camtasia Studio;

- Author original music using OBS Studio, Pro Tools, Ableton Live, Steinberg Cubase, Adobe Audition, Band-in-a-box, Sound Forge.

## PROFESSIONAL ASSOCIATIONS

- Former principal organizer of the Bay Area Scala Enthusiasts user group December, 2011 to May, 2013. Grew membership to largest Scala user group in the world.

- Founder of the SF Scala meetup; managed group from November, 2011 to February 2012.

- Participated in a governmental technology policy discussion in January, 2010 by invitation of the British Columbia Premier's Technology Council.

- The National Research Council of Canada has referred Canadian entrepreneurs to me for advice.

- Participated in an panel of judges at Simon Fraser University in Vancouver in 2008 which was set up to critique student business plans;

- Recruited by the Silicon Valley office of the Canadian Consulate to advise Canadian software companies;

- Former member of the Curriculum Advisory Committee for the Foothills College Computer Science Department;

- Chairman of the Silicon Valley Ruby Conference in 2007 on behalf of SD Forum; was co-chairman in 2006;

- 1985 to 2003 – Professional Engineer registered with the Association of Professional Engineers and Geoscientists of BC (APEGBC). Allowed membership to lapse after deciding to remain in the USA.

- Was an APEGBC Community Awareness volunteer (visiting elementary and high schools and promoting career interest in science and engineering)
- Was an APEGBC Mentor (to help new engineers learn professional practice)

- Was a volunteer with BC Science World, visiting elementary and high schools promoting awareness in science and engineering;

- 1988 to 1992 – Was a featured speaker for various CAD-related groups and events;

- 1986 to 1992 – Past chairman and founding member of the Vancouver AutoCAD User Society, grew membership to the largest AutoCAD user group in the world;

- 1982 to 1985 – Former member of the IEEE Vancouver Chapter Steering Committee.

## OTHER

- Ham Radio operator, General class