Bruce C. Miller

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PROFESSIONAL OBJECTIVE

With a career-spanning focus on functional programming languages, functional design, data modeling, and data analytics, I have an affinity and desire to continue building systems that extract meaning from large datasets.

SKILLS

- 10 years of professional development and system design in Clojure. Additionally experienced in Haskell, Java, C#, Python, Common Lisp, Scheme, Emacs Lisp, and SQL.
- Extensive experience as a software engineer, with ability and interest in continuing to act as such, and/or in data architect, analytics developer, and applied research engineer roles.
- Professional experience with a wide range of "back-end" technologies, primarily those that deal with the processing, modeling, and analysis of large data. These include the Java ecology, .Net, AWS/Azure, most major RDBMSes, development infrastructure tools, and distributed computing.
- Familiarity with non-relational datastores, LaTeX, several Unix-variants, GNU Emacs, data visualization, full-stack development, team leadership, written/oral presentation, and various markup and scripting languages.
- Experience working (mostly) fully remote since 2015.

WORK HISTORY

████████████████ (2022-present)
Software Engineer

Currently building data flow and data analysis fintech systems in Clojure for the derivatives and commodity markets.

- Acting as 1 of 3 core Clojure developers on the company's widely-used flagship product, capable of modeling, handling, and aggregating a massive quantity of financial data of disparate forms and representation standards.
- Doing full-stack Clojure development.
- Using ClojureScript with reagent and re-frame.
- Learning the financial domain, and converting existing data management and analysis knowledge to this space.

Kāpili Services (2019-2021)
Clojure Back-end Engineer

Successfully converted a proof-of-concept solution to an enterprise-wide, in-production state for C5ISR, part of the US Army's DEVCOM, at Aberdeen Proving Ground.

- Modeled the application domain using custom functional patterns, leveraging Clojure's features and ecosystem.
- Built out and refined an application on top of Berkeley DB, a NoSQL, key-value datastore.
- Rewrote and redesigned entire system using functional programming best practices, also switching its datastore over to MongoDB and Cosmos.
- Concluded project by having application deployed to Azure, loading/hosting production data, and serving clients (including a web front end) via its REST API.

Booz Allen Hamilton (early 2019-late 2019)
Lead Technologist

Worked on the FBI's Next Generation Name Check Program during its transition phase to AWS, containerization, and an overall tech stack refactoring to meet modern standards and scaling needs.

- Provided full-stack development, mainly in C# and T-SQL, on an extremely large, highly integrated, in-production system.
- Responsible for part of the project's monolith to microservices and datacenter to AWS migration. Infrastructure includes use of Docker, cri-o, Kubernetes, and AWS Lambda.
- Contributed to the early design effort integrating machine learning technologies and practices, in an effort to reduce the vast number of human operators currently needed to meet client demand.

Whiteboard Federal Technologies (2014-2018)
Principle Software Engineer/Team Lead

Took a lead role in the Pentagon G2's AICIG, a project focused on strategic and efficient force management, delivering and improving essential perspectives critical to the US Army's intelligence command.

- Acted as tech lead and team lead for the project. Converted a small, pre-existing team of 3 JavaScript/Groovy programmers into a team of 6 Clojure programmers. Managed this team and supporting personnel, and interfaced with the management of parallel teams of analysts, administration, and operations.
- Designed the underlying architecture for all products. Confining side effects and maximizing features like testability, maintainability, and program correctness were priorities. Designed the hardware manifestation of the production system.
- Prototyped experimental features to demonstrate feasibility.
- Programmed exclusively in Clojure, using Emacs. As an extremely dynamic ecosystem, dedicated extensive effort to tracking latest developments, filtering out applicable technology.
- Designed the project's non-relational data layer using MongoDB.

- Managed regular interaction with government clients and non-technical project management. Conducted all technical interviews. Managed the development schedule. Decided upon optimal level of development methodology overhead using an experimental and empirical approach.

Sotera Defense Solutions (formerly Potomac Fusion, Inc.) (2010-2013)
Senior Software Engineer

Employed by DARPA on a project called XDATA, performing research towards developing an analytics framework that operates against extremely large datasets to be used across all related DARPA projects.
- Designed a composable analytics framework, using Clojure and a Clojure EDSL called Cascalog, bringing together disparate cloud capabilities (primarily available on JVM languages) into a single, unified, functional model.
- Researched the state of the art in cloud computing and applicability to project goals.
- Wrote large data analytics in Python.
- Interfaced with academic subject matter experts.
- Authored project white papers in LaTeX.

Until Mar 2012, developed cloud analytics at a DARPA project called Nexus7, which explored analytic capability against extremely large IC datasets, in an attempt to address seemingly intractable problems at the strategic level. These solutions were applied to the war in Afghanistan, and had a measurable positive impact during some of its most challenging years.
- Worked with many cloud technologies, primarily Hadoop (HDFS/MapReduce) and Apache Hive, writing and optimizing analytic algorithms within them.
- Built visualizations fed by machine learning algorithms within Weka and Apache Mahout.
- Analytics development primarily in Python, HiveQL, and Clojure.
- Deployed to Afghanistan for 7 months, supporting in-theater operations at strategic and tactical levels. Developed big data solutions against live data and gave presentations to military and civilian decision-makers.

Until Feb. 2011, was part of an "Advanced Analytics" group for project GlobalWatch, delivering data visualization and analysis tools to the primary IC agency. These solutions were directly applied to a theater of operations.
- Held a principle engineer back-end role wherein the primary mission was to create frameworks for anomaly/change detection within live data feeds.
- Subsumed requisite knowledge of statistical learning models, machine learning, and statistics.
- Software development within the JVM ecology, in Java and Jython.
- Augmented front end development in JavaScript, jQuery, Ext JS, and JSP.
- Supported build management with Maven and Nexus.
- Interviewed candidates for senior to junior level development positions.
- Carried out on-site deployments of releases in South Korea.

iSYS, LLC (2007-2010)
Senior Software Engineer

Part of a team responsible for the "Next Generation" CODIS (Combined DNA Index System), the primary DNA Forensics database and search engine funded by the FBI and used in all forensic DNA work within the US and (at the time) 22 foreign countries.
- Full participation in the software development life cycle for a large (over 1 million SLOC), enterprise-grade, distributed application.
- C# development, employing the use of design patterns, WCF, LINQ, and Parallel Extensions.
- Intermittently focused on database design and development in SQL Server, with stored procedures in T-SQL.
- Led development for several critical features within CODIS, such as its primary data interface (called Specimen Manager), Prüm Treaty support (used by EU nations), and tuning algorithms to meet performance goals.
- Interviewed candidates for senior to junior level development positions.

e-LYNXX Corporation (2004-2007)
Software Engineer

Worked on designing and developing components within a large-scale n-tier application in active use, managing a high volume of government and private sector financial transactions.
- Participated in requirements analysis, design, development/implementation, debugging, and maintenance.
- Developed in C# using Visual Studio 2003/2005, Delphi in Borland Developer Studio 2006, and PL/SQL development in PL/SQL Developer.
- Database integration with Oracle 8i, 9i, and 10g, writing stored procedures, data modeling/remodeling, and using DALs such as Direct Oracle Access and ODP.Net.
- Conducted research and implementation of architecture improvements using various design patterns, features of the .Net Framework, and concepts from the academic community.
- Migrated and redesigned legacy codebases from Delphi 5 to Delphi 2006 and C#.
- Carried out B2B integration using WebServices, EDI (Electronic Data Interchange), and domain-specific cXML.
- Designed/developed ancillary and supporting Windows services in C# and Delphi 2006.
- Did build script management and build deployment.

Inclusive Technology Solutions Inc. (2005-2007)
Senior Software Engineer (part-time)
Acted as a senior member of an IT consulting firm, where initial responsibilities included the full development process, later migrating to a project lead role on all n-tier web application/e-commerce.

- Projects managed and/or implemented involved languages such as C#, ASP.Net, PHP, JavaScript; design in XHTML and HTML; and on platforms such as Solaris, Linux, and Windows Server.
- Conducted requirements and design analysis; selecting best platforms, technologies, architectures, and structural paradigms.
- Reviewed all code for best practices, W3C standards compliance, and cross-browser compatibility.
- Designed client databases in MySQL.
- Coordinated exchange between internal client contacts, junior developers, graphic designers, and external contractors.

C&L Instruments (2001-2002)
Software Engineer
Completed development of a fluorescence imaging data acquisition and analysis application in Visual C++ 6.0 for use in studying ratio imaging and ion concentration in cellular biology experiments.

- Was fully responsible for all stages of the SDLC, including requirements analysis, design, development/implementation, debugging, and maintenance.
- Designed and programmed a GUI in MFC and GDI, including image display, complex image manipulation, and graphical data analysis.
- Wrote wrappers for numerous proprietary imaging APIs to support various manufacturers' digital microscope cameras via a unified UI.
- Co-developed device drivers in C++ for in-house expansion cards controlling fluorescent microscopes, illuminators, and filter controllers.
- Assimilated a large amount of domain-specific knowledge regarding fluorescent microscopy and biotech research in general.

Mantra Communications (May 2000 - August 2000)
Software Engineer (intern)
At a dot-com startup exploring real-time bandwidth modification, developed an administrative front end in Java for the company's flagship product, ported various Java and C packages to/from HP-UX and Solaris, and designed numerous ancillary and internal applications.

- Participated in the SDLC in detailed design, implementation, debugging, and maintenance.
- Programmed server-side web applications using JSP and Java Servlets.
- Developed in Java using Borland JBuilder.
- Wrote database integration with JDBC.

EDUCATION

Shippensburg University Shippensburg, PA • Bachelor of Science in Computer Science with a focus on Systems Programming, 1997-2001

Shippensburg University Shippensburg, PA • Masters of Science in Computer Science, 2002-2004
27/30 credits attained (3.66 GPA)

OTHER ACTIVITIES

- Continuing education with development-related classes and workshops, attendance to developer conferences, and perpetual self-guided education.
- Active Top Secret SCI clearance (expired FS Poly).
- Creator and active contributor of a game server emulator project in Java and MySQL: http://l1j.org.
- Publicly accessible code samples available at: http://github.com/bm3719.
- Until recently, was the co-organizer of the National Capital Area Clojure Users Group for several years: http://www.meetup.com/Cap-Clug/. The focus of lectures I have given here are functional programming topics in Clojure and their underlying theory.