Sam Stuewe

Software Architect and Engineer

Fieldwork

2021–Present   **CBDC Software Engineer**, *MIT Digital Currency Initiative*, Boston, MA (Remote)
- Helped design, implement, test, and benchmark hypothetical designs for central bank, digital currencies (CBDCs)
- Designed, established, and organized an open-source project and community to research questions surrounding CBDCs
- Conducted formal code reviews
- Guided and mentored student workers in a variety of positions from software engineering to product management
- Reviewed and edited academic papers and presentations
- Presented on CBDC topics various times (in online workshops, roundtables, and in-person meetings and conferences)
- Aided in evaluating and hiring candidates for various roles

2019–2021   **Senior Software Engineer**, *Emergent Software*, Edina, MN
- Discovered and Documented Client Requirements for more than 6 projects of varying sizes (200 to 1000 hours)
- Implemented projects as the Primary Engineer for multiple clients using Javascript, Typescript, React, Umbraco, C#, and others
- Created a Client's internal, web-based ERP reconciliation tool
- Updated a Client's Content Management System for better customer feedback, GDPR compliance, a better mobile experience, and enabling multi-lingual content
- Completely rebuilt a Client's website, database and reporting system from the ground-up in modern C#
- Aided other engineers in problem-solving and getting work finished on-time and to-specification

2017–2019   **Software Architect and Lead Software Engineer**, *Conklin Company, Inc.*, Shakopee, MN
- Architected and Redesigned a commissioning system used for more than 19,000 customers
- Guided and Managed development of six company-wide software projects
- Interviewed more than 50 candidates for development roles
- Hired and Managed nine software developers
- Aided in completely rewriting company infrastructure and end-user facing applications
- Worked with a team to deliver functioning, tested code on-time
- Supported and deployed various linux machines (predominantly CentOS) for testing and production environments

2014–2017   **Software Development and Technical Support Manager**, *AbleNet, Inc.*, Roseville, MN
- Guided and Managed development of software projects
- Maintained, updated and pushed one major release and one minor release of a legacy code-base, assisting in a complete graphical overhaul and spearheading multiple major bugfix efforts
- Interviewed, hired and managed software and web developers
- Developed and maintained various software projects for the company

Communication Skills

2019–Present	Presenting/Transcribing Technical Talks
2017–Present	Leading team meetings and strategy sessions
2015–Present	Writing documentation, and programming style guides
2014	Public Presentation and Defense of Thesis
2012–2013	Political Campaign Literature Creation

Computer Skills

Programming Language Experience

Advanced **C# (6–8)**

- Dramatically curtailed unnecessary complexity (net SLOC reduction >50 percent) including feature additions
- Rearchitected four major components to better implement business requirements
- Redesigned, unified and rewrote two large (>1m sloc) native application suites as MVVM-based web applications for both internal and external users
- Worked with Microsoft SQL Server integrations for persistent data storage
- Leveraged new language features, Entity Framework and .NET Core
- Updated an Umbraco (a Content Management System) instance with several new features, including improved contact-us form submission

Advanced **ISO C++ (98, 11, 17)**

- Maintained, updated and pushed one major release and one minor release of a legacy codebase (consisting of over 1 million lines of C++98) assisting in a complete graphical overhaul and spearheading several major bugfix efforts
- Created, Administered, and Reviewed technical exams using C++
- Created, Developed, Published, and/or Maintained multiple repositories in the 1k-sloc range from small, terminal games, to cutting-edge digital-currency software

Advanced **C (C99–C18) and C++ (C++98)**

- Worked with the gamut of ISO, POSIX, and GNU flavors of C, compilers from MSVC, to GNU and LLVM, to Fabrice Bellard's TCC, and libcs from GNU, to musl
- Gained deep familiarity with a varity of major external libraries (from ncurses, to gmp, to libsodium, to msgpack)
- Developed and maintained a powerful command-line interface program to interact with a versatile pastebin, which is now officially redistributed by ArchLinux (a major linux distribution)
- Developed and maintained a binary, library and extensible API (heavily integrated with upstream APIs) to fetch weather data for use by both end users and fellow developers
- Developed and maintained a watchface for the Pebble Time smartwatch
- Created various utilities integrating with upstream APIs for random number generation, checking website status, fetching external IP addresses and URL shortening among others
- Formally educated at Macalester College in low-level systems, distributed and parallel programming

Advanced **SQL (Transact/SQL Server, SQLite)**

- Authored hundreds of queries (thousands of lines) for ad-hoc reporting and accomplishing longer-term business goals
- Optimized over 100 queries for real-time use (reducing runtimes from minutes to miliseconds)
- Architected new schemas to replace a poorly-designed, aging system
- Some familiarity with Microsoft SSDT for migrating data across systems and to different schemas
- Leveraged Common Table Expressions, recursion, and Table-Valued Functions liberally for optimization and clarity improvements

Advanced	**Haskell (Haskell2010)**
	○ Developed and deployed a web application for easy online assessment scoring for use by more than 2000 users
	○ Worked with a dramatically large set of libraries ranging from the base module to various external modules for tasks ranging from serving web pages to interacting with SQLite databases to exporting documents in various formats
	○ Created a variety of small utilities for personal use including for system status monitoring and special-case text formatting
	○ Deployed and continued to maintain a sleek, personal website
Advanced	**Lua (5.x and LuaJIT)**
	○ Prototyped and Implemented a fully-featured IRC bot complete with many novel features including remote, secure updating; a plugin system; live upgrades with minimal downtime
	○ Created various small utilities and libraries for working with a variety of fundamental and higher-level data structures
	○ Reimplemented basic Object Oriented design
	○ Worked on projects with Terra (the statically-typed LLVM-based cousin of Lua) and Löve2D
Advanced	**Javascript and Typescript**
	○ Created a reconciliation tool for a Client's Enterprise Resource Management system using React, Kendo, Axios, and several other frameworks and libraries
	○ Developed a web application for a Client's customers using Typescript and React
Advanced	**Web Markup Languages (HTML5 and CSS3)**
	○ Deployed an interactive web application (using a subset of HTML5, JS and CSS3 in an attempt to be as widely compatible as possible) that worked with a wide variety of markup languages including Restructured Text, Markdown and LaTeX
	○ Leveraged HTML5 to emulate a full Single-Page Application but still maintaining the highest standards of compatibility, accessibility, and performance
	○ Designed and tested sites for standards compliance, performance, security and accessibility
	○ Aided a Macalester professor in creating his own website (with HTML5 and CSS3)
Advanced	**Java (JDK6)**
	○ Formally educated at Macalester College including a full in-depth overview of the language (including data structures, error/exception handling, Object Oriented and graphical design)
	○ Reimplemented many fundamental data structures (e.g., maps, trees, stacks, queues, dictionaries, lists (single and doubly-linked))
	○ Created many simple fully graphical projects including a clone of Conway's *Game of Life*, a slot machine and a *Breakout* clone
Intermediate	**Agda**
	○ Wrote literate programs to make human-readable documentation integrated with machine-code
	○ Explored Agda's unique safety guarantees as a Dependently Typed, theorem-proving language
Intermediate	**Python (2.x and 3.x) and R**
	○ Implemented basic applications for common personal use (e.g., a contact book)
	○ Wrote several statistical and data analysis scripts for classes at Macalester College
	○ Completed a statistics course at Macalester College that included an overview of R
	○ Took a summer-long independent study with a professor at Kansas State University, Salina to become proficient with Python

Operating Systems

Advanced **GNU/Linux**
- Over four years of systems administration for production, testing and personal servers and workstations
- Familiarity with both manual and automated deployment of Linux virtual machines, desktops and servers (rackmount and tower formfactor)
- Over a year of production maintenance with several distros hosting company infrastructural and user-facing content web services
- Daily personal use and system administration for the last twelve years
- Deep familiarity with the file system hierarchy, OS organization and system calls
- Extensive experience setting up and maintaining OpenLDAP
- Some experience setting up and maintaining kerberos to integrate with Active Directory

Advanced **Microsoft Windows**
- Daily support of end users on Windows using various programs for over six years
- Extensive experience setting up and maintaining Active Directory
- Over six years of software development and maintenance for programs targeting Windows
- System and network administration of production, testing and personal servers and workstations for several years

Advanced **macOS and osx**
- Daily support of end users on OSX using various programs for over three years
- Over a year of software development and maintenance for a program targeting OSX

Basic **BSD ("Net" and "Free")**
- Limited experience with "Ports" and BSD installation, configuration and usage

Interests

- Computers
- λ-calculi and Math
- Rock Climbing
- Racquetball
- Computational, Political (and other bodies of) Theory
- Free and Libre Open-Source Software
- Typesetting, Document Publishing and typography

Education

2010–2014 **Bachelor of Arts**, *Macalester College*, GPA − 3.65
Cum Laude and Departmental Honors in Political Science

Spring 2013 **International Exchange**, *L'institut d'études politiques de Paris*, GPA − 4.0

Bachelor's Honor Thesis

Title *On the Nature of Political Interaction as Conversation*

Supervisors Professors David Blaney, Andrew Latham and Terry Boychuk

Description This thesis synthesized a new framework for analyzing political interaction using an accessible and extensible metaphor