JOEL SIEH

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Senior engineer with 20 years of experience in full-stack development and leadership, focused on achieving collaborative success and building a quality product.

WORK EXPERIENCE

SRI International, Ann Arbor, MI / Menlo Park, CA **2008-present**

Senior Software Engineer, Center for Software Engineering

Maritime Information Extractor & Reducer (MINER) program

- Led a team of four engineers using Agile Development Methodology. Designed a new distributed system architecture using Amazon Web Services, advised the customer directly, mentored team members, and developed Java-based system components. The new system added cloud storage, redundancy, and failover capabilities, leveraging COTS products to significantly reduce the codebase. MINER has become a core product of the Naval Research Laboratory.

Beachcomber program

- Designed the software architecture of the Airborne Detection Products Scheduler. The architecture used a Message-Oriented Middleware product interfaced with custom software components to provide scheduling and execution of radar algorithms, as well as a subscription service to distribute results of continuously-running algorithms. Critical Design Review was successful, and program is slated for development.

Foresight and Understanding from Scientific Exposition (FUSE) program

- Led a team of three engineers in designing and developing a system to predict emerging technologies based on analysis of published research papers and patent applications.
- Worked with team to engineer a data storage and retrieval solution designed to store data and generated metadata for a large corpus of documents. This system was composed of MongoDB, Apache Lucene/Solr, and a collection of Scala code to provide query and data transformation functionality to subcontractors. Included a Java API to facilitate adoption by subcontractors.
- Engineered Scala code to parse and ingest hundreds of thousands of documents conforming (sometimes badly) to various XML file formats.
- A key challenge was that documents were only viewable remotely over an SSH connection, making the development and testing of parsers difficult. Utilizing the Scala REPL, our team was able to engineer our parsers more quickly than the competing teams. We demoed and offered our libraries, as well as our database of already-ingested documents, as a service to the competing teams shortly after program start.
- Our team scored the highest marks of all five teams at the year-end evaluation.

Knowledge Discovery and Dissemination (KDD) program

- Contributed to the development of a suite of web-based tools to allow searching through a collection of data sources with diverse formats. This included developing Java code on the back end to process user-driven search queries against Apache Lucene/Solr, as well as designing and developing front-end user-interface components using JQuery and Bootstrap.
- Designed and developed a web application to help intelligence analysts store and organize their findings and generate downloadable reports. This system primarily utilized JQuery and IndexedDB.

Modern Author Online Learning System

- Worked with a small team to quickly develop a prototype. Developed a Java-based RESTful Web service that interfaced with the Apache Chemistry Content Management System (CMS). This web service was used to store and retrieve user-editable documents. By the end of a two-month period, we were able to successfully demo a prototype to secure additional funding.

Bootstrapped Learning (BL) program

- Created prototype Unmanned Aerial Vehicle (UAV) simulator for use with the AI component, and recorded a demo movie to showcase the product. Designed and implemented a C++ plugin for the X-Plane flight simulator to add UAV control functions, learning feedback UI controls, and extra display modes to monitor the UAV's actions and state. This helped secure funding for BL Year 3 research.
- Expanded the UAV simulator's capabilities to support the growing needs of the AI system and our subcontractor researchers. Features included accepting remote commands from Java, multi-platform compatibility, scenario setup and control features, support for Wizard of Oz studies, etc.
- Assumed responsibility of the RoboCup simulator package and refactored it for performance and maintainability. This included porting large sections of the software from C++ to Java. Added significant new capabilities to facilitate a parallel AI project sponsored by BBN Technologies. This work secured extra financial support to fund the project.

Raytheon Integrated Defense Systems, Tewksbury, MA 2003-2008

Senior Software Engineer

Zumwalt Modeling and Simulation (M&S) Total Ship System Simulation (TSSS) Integrated Project Team (IPT)

- Served as External Communications technical and team lead on seven projects, supervising them throughout the entire software development life cycle.
- Invented and developed the Message Generator, a tool to generate TCP/IP and UDP message transmission code from XML documents. Shared this software with TSSS and other teams, which directly resulted in fewer development errors and significant productivity and financial savings. This tool used Perl and C++ templates, and involved reworking existing network code.
- Leveraged message generation approach to save $7M on a simulation bid and developed proof-of-concept prototype using C++ and Java.
- Maintained and enhanced the Data Adaptation Processor (DAP) Proxy integration-level test tool using C++, migrated it from Windows to Linux, and added LUA scripting capability to facilitate automated integration testing.

Zumwalt Total Ship Computing Environment Infrastructure (TSCEI) IPT

- Automated manual process of creating a code package for peer review on TSCEI and shared the tool with other teams to improve productivity.
- Developed high-performance Time Services (Timer and Clock functionality) library for TSCEI. Library included multiple timer implementations, including real-time multithreaded timers with callback functionality. The timers I built performed significantly better than native Java timers. For this project, I also created a Java server to query network time servers using the Network Time Protocol (NTP). This code targeted the LynxOS Embedded Real-Time OS.
- Developed simulation models, simulation infrastructure, and ship computing infrastructure code using various technologies including C++, Java, JNI, CORBA, DDS, JMS, ACE/TAO. Used design patterns, network and multithreaded programming, and Agile Development Methods to create robust, scalable, high-quality code that met strict performance requirements.

University of Massachusetts, Amherst, MA **2000-2003**

Research Assistant, Lab for Advanced Software Engineering Research

- Researched resource management issues in process coordination; used Java, XML, and DOM to develop the Resource Manager component of the Little-JIL process programming language run-time infrastructure.

Control Room Technologies, Inc., Lansing, MI **1998-2000**

Web Developer

- Created dynamic web applications using Cold Fusion, SQL Server, Visual C++, Javascript, Visual BASIC, Java, PHP, ASP, and Perl.

Digital Active, LLC, Lansing, MI **1997-1998**

Web Developer

- Built web applications with PHP, Perl, MySQL, Javascript, and Java.

EDUCATION

University of Massachusetts, Amherst, MA **2003**

M.S. in Computer Science Thesis Advisor: Leon J. Osterweil

Master's Thesis: *The Multiple Roles of Little-JIL in Government E-Processes: Requirements Specification, Simulation, and Automation*

Michigan State University, East Lansing, MI **2000**

B.S. with Honors in Computer Science and Engineering

Minor Concentration in English

(978) 846-4131 Joel Sieh joel.sieh@gmail.com

SKILLS

Languages, Tools, and Operating Systems

Java, C++, Scala, JavaScript, C#, J2EE, SQL, LUA, Bash, Python, Ruby;
Frameworks & Dev tools (JQuery, AngularJS, Bootstrap, Mustache, JSON, XML, Corona SDK, RabbitMQ, Kafka, Docker, Kubernetes, MongoDB, Apache Spark, Solr, Tomcat, AWS, Hadoop, JIRA, JFrog Artifactory, Eclipse, IntelliJ IDEA); CM tools (Git, Mercurial, Bitbucket, SVN);
Build tools (Gradle, Maven, CMake, Jenkins); UML tools (Rational Rose, Enterprise Architect)
Agile; Mobile development; Real-time embedded development
MacOS X, Linux, Windows

Other Skills

- U.S. Citizen with active TS/SCI clearance.
- Experience leading teams both as technical and project lead.
- Strong architecture and design skills, knowledge of design patterns.
- Strong algorithmic analytical ability and adaptive to new technologies and codebases.
- Experience working with remote customers and co-workers on distributed teams.
- Excellent written and interpersonal communication skills.

HONORS AND AWARDS

- Personal Performance Award for MINER, 2017
- Personal Performance Award for Modern Author, 2014
- Raytheon Six Sigma Specialist; completed three Six Sigma projects
- Nominated for Engineering Leadership Development Program
- Personal Achievement award, TSSS - Automation Initiative
- Personal Achievement award, TSSS - Data Collector
- Team Achievement award, TSSS - successful Critical Design Review
- Personal Achievement award, TSCEI - R2 Time Services Library
- Team Achievement award, TSCEI - successful Release One