Aaron Rotenberg

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Expertise

- **Technologies:** Java (including JUnit, Maven, Gradle, JVM bytecode), Haskell, Python, XML (including XSD)
    - **Some experience with:** JavaScript (including React), HTML, CSS, Jenkins CI, AWS (S3, CloudFront, EC2), Docker, GraphQL, OpenGL, C#, C, MATLAB, SQL
- **Concepts:** Object-oriented analysis and design, functional programming, design patterns and refactoring, UML, unit testing, performance profiling

Past employment

June 2020-present: Software Engineer, CompilerWorks

- Helped design and implement key functionality of CompilerWorks' data lineage server, working with both the back-end GraphQL server written in Java as well as the React-based front-end; developed features such as:
    - Implemented the lineage node labeling system, including the concurrent propagation backend running on graphs with millions of nodes, to allow users to identify PII and deprecation impacts
    - Implemented connectivity and edge justification features, providing users with compact explanations of the lineage history of their data
    - Fixed numerous issues with lineage computation, to ensure mathematical correctness and address customer needs

June 2011-May 2020: Software Engineer, Cyient, Inc. (previously CERTON, Inc., acquired in 2017)

- One of two lead developers on the R&D team designing and implementing the CertSAFE tool for safety-critical software modeling and simulation, written in Java+Swing using a Kanban/Lean process
- Designed and implemented key features of CertSAFE, such as:
    - Implemented a Hindley-Milner-based type system to spare users from having to constantly write redundant data type information
    - Created a tracing system using biconnected components to provide visually-satisfying representations of data flow across wire networks
    - Devised an algorithm for in-memory compression of simulated data using search trees to allow long simulations to be navigated efficiently in the user interface
    - Conceived of, designed, and implemented an automated test generation tool for software models based upon SMT solving using solvers implementing the SMT-LIB standard
    - Designed and implemented a code generator to convert large dataflow models to C code
    - Implemented Microsoft's Flash Fill algorithm for program synthesis from text examples to provide suggestions for renaming variables in models
- Wrote JUnit test suites to help verify complex features; used test-driven development to help reduce defects in new code
- Authored a majority of the content for a CertSAFE-related patent (see below)

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- Wrote a user interface in C# and a backend in C++/CLI implementing a customer-defined locomotive networking protocol, ultimately resulting in a series of additional contracts with that customer
- Flew to customer sites and presented in person as well as over the internet to support potential sales and train external users on the use of tools developed in-house
- Interviewed candidates for Software Engineer, SQA Engineer, and Product Specialist roles, and helped design the technical screening process for these roles
- Managed license servers and other services running on AWS EC2 instances

May-August 2010: Software Engineer, Alpha Medical Corporation

- Designed and implemented a system for automated tracking and calculation of patient Coumadin dosages in Java with a JSP frontend, deployed to a Tomcat server

May-August 2009: Software Engineering Intern, Clear Choice Health Center

- Developed a system for automated reporting of OCR survey scans
- Implemented process improvements through scripting

Patent

- Aaron Rotenberg, Rocus Halbasch, Vanessa Uphoff. Patent US 10,747,921 B2 "Software tool for simulating operation of hardware and software systems."

Other past projects

- Developed a Haskell library for compiling lazy functional languages to the JVM, available on GitHub
- Implemented a high dynamic range 3D raytracer in Java
- Developed real-time Internet collaboration software with a team at Florida Tech (senior project)

Education

May 2011: B.S. in Software Engineering, Florida Institute of Technology (summa cum laude)

Online

- https://stackoverflow.com/users/925960
- https://github.com/arotenberg
- https://aaronrotenberg.com/