

# Aaron Rotenberg

adrotenberg+jobs@gmail.com

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## Expertise

- **Technologies:** Java (including JUnit, Gradle, JVM bytecode), Haskell, Python, XML (including XSD)
  - **Some experience with:** JavaScript (including React), HTML, CSS, Jenkins CI, GCP (GCS, GCE, Cloud Run), 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, programming language theory and compiler design, type theory, graph theory

## Past employment

**June 2020-present:** Software Engineer, Google (previously CompilerWorks; acquired in 2021)

- Testing and validation lead for the SQL Translation Engine of the BigQuery Migration Service (BQMS)
  - Designed and implemented a GCP Cloud Run-hosted remote validation service for testing the behavior of SQL against various database backends
- Designed and implemented key functionality of the BQMS data lineage server, working with both the backend GraphQL server written in Java as well as the React-based frontend; 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

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- 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 the majority of a CertSAFE-related patent (see below)
- 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."

## **Education**

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

## **Online**

- <https://www.linkedin.com/in/aaron-rotenberg-2a689677/>
- <https://github.com/arotenberg>
- <https://aaronrotenberg.com/>