Curriculum Vitae

Alexander Spoon

https://www.lexspoon.org

Education

Ph.D. in Computer Science. Georgia Institute of Technology. August 2005. Thesis title: "Demand-Driven Type Inference with Subgoal Pruning." Advisor: Olin Shivers. Committee: Ole Agesen, Mary Jean Harrold, Spencer Rugaber, Yannis Smaragdakis.

B.S. in Computer Science. Clemson University. December 1996. GPA: 4.0/4.0. Graduated summa cum laude with senior departmental honors.

International Baccalaureate. May 1993. Studied in the Greenville County School District of South Carolina.

Software Development Positions

Cognira, principle software architect, March 2024–December 2024. I improved the company engineering practices with fundamentals such as design documents, shared integration environments, and trunk-based development. This involved learning how the existing organization works, reflecting on my prior experience at FANG-like companies, building prototypes, and coaching and socializing on how others can use these practices.

Block, software engineer and manager, May 2016–January 2024. I contributed to core building blocks of the software stack: the account system, the feature flag system, and the internal ML platform. The account system receives over 30,000 requests per second and has multiple layers of redundancy and failover. The feature system has been adopted for over 10,000 feature rollouts, despite no company mandate to use it.

Semmle, research engineer, October 2012–May 2016. I built out several areas of functionality that our customers and prospects wanted: Scala support, unit testing, the add-on packs infrastructure, and the initial security pack, containing queries to scan software for security weaknesses. The security pack was pivotal for the company's successful exit via a GitHub acquisition.

LogicBlox, research engineer, October 2010–October 2012. I worked on enabling technologies for the company's Datalog platform, including: type checker cleanups, the JavaScript backend, declarative UI improvements, and the "ports" I/O framework for networking, browser events, and browser control.

Google, software engineer, January 2008–October 2010. I worked on the Google Web Toolkit, for example: the progressive code loading system, overhauling the control- and data-flow analyzers, fixing multiple buggy type analyzers, and the co-design of core features including the Code Report and the draft compile mode.

TECNET, software developer, May 1994–December 1996. While an undergraduate at Clemson, I worked on a team of students and professors to develop a communication hub for the Department of Defense's Test and Evaluation Community Network (TECNET).

Research Positions

Post-doctoral position with Vijay Saraswat at IBM Research, February 2007–December 2007, half-time at first. I assisted with the design and implementation of X10, a language for high-performance computing, both in its pure form and with a Scala-like front-end.

Post-doctoral position with Martin Odersky at EPFL, October 2005–October 2007, half-time at the end. I assisted with the development of the Scala language, including work on program analysis, pluggable type systems, package distribution, and API evolution. I enhanced the REPL to become a reliable, daily tool for the language's users.

Research intern at Hewlett-Packard, June 2004–August 2004. Studied type inference for the Squeak dialect of Smalltalk. I proved the DDP algorithm correct and developed a program browser that incorporates type-inference queries.

Research intern at Disney Imagineering, June 2000–July 2000. Designed and implemented a security mechanism for the Squeak programming system at Disney so that users may safely interact with untrusted Squeak projects.

Research intern at IBM Almaden Research Center, June 1999–July 1999. Worked on an experimental portable device to be used by airport patrons. I worked on porting the Squeak virtual machine to the system, and I contributed to the networking code and the software development infrastructure.

Research intern at Disney Imagineering, June 1998–August 1998. Developed Internet access tools for Squeak, including a Web browser, parts of an email reader, an IRC client, and a telnet client.

Undergraduate research assistant at Clemson University, May 1994–December 1996. Developed a parallel algorithm for the final stage of Fredrick Harris's overall algorithm for Steiner Minimal Trees.

Publications

Books

Odersky, Martin, Lex Spoon, and Bill Venners. *Programming in Scala*. California: Artima. 2008.

Book Chapters

Parsia, Bijan, Bolot Kerimbaev, and Lex Spoon. "Networking Squeak". In *Squeak: Open Personal Computing and Multimedia*, edited by Mark Guzdial and Kim Rose. New Jersey: Prentice Hall. 2002.

Patents

Spoon, Alexander. Data flow analysis with collapsed contexts. U.S. Patent 9,823,912, filed October 15, 2015, and issued November 21, 2017.

Spoon, Alexander. Compilation cache with imports scanner. U.S. Patent 9,696,973, filed February 24, 2016, and issued July 4, 2017.

Spoon, Alexander, and Julian Tibble. Annotation natural keys for source code analysis. U.S. Patent 9,652,359, filed October 27, 2016, and issued May 16, 2017.

Spoon, Alexander. Type widening for source code analysis. U.S. Patent 9,652,358, filed May 25, 2016, and issued May 16, 2017.

Conference Papers

Spoon, S. Alexander, and Olin Shivers. "Dynamic Data Polyvariance Using Source-Tagged Classes." Dynamic Languages Symposium (DLS) 2005.

Spoon, S. Alexander, and Olin Shivers. "Semantic Navigation of Large Code Bases in Higher-Order, Dynamically Typed Languages." Working Conference on Reverse Engineering (WCRE) 2005.

Spoon, S. Alexander, and Olin Shivers. "Demand-Driven Type Inference with Subgoal Pruning: Trading Precision for Scalability." European Conference on Object-Oriented Programming (ECOOP) 2004.

Harrold, Mary Jean, et. al. "Regression Test Selection for Java Software." ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA) 2001.

Spoon, Lex, and Mark Guzdial. "MuSwikis: A Graphical Collaboration System." Computer-Supported Collaborative Learning Conference (CSCL) 1999.

Pargas, Roy P., Jennifer Ludwick, and Steven A. Spoon. "Hybrid Search Algorithms." ACM Symposium on Applied Computing (SAC) 1997.

Refereed Workshop Papers

Spoon, S. Alexander. "Fine-Grained API Evolution for Method Deprecation and Anti-Deprecation." Foundations and Developments of Object-Oriented Languages (FOOL/WOOD) 2007.

Spoon, S. Alexander. "Anti-Deprecation: Towards Complete Static Checking for API Evolution." Library-Centered Software Design (LCSD) 2006 (adjunct to OOPSLA 2006).

Technical Reports

Spoon, Alexander. "Package Universes: Which Components Are Real Candidates?" Technical Report LAMP-REPORT-2006-002, École Polytechnique Fédérale de Lausanne (EPFL), 2006.

Teaching Experience

Co-instructor of "Type Systems", October 2006–February 2007, at the École Polytechnique Fédérale de Lausanne (EPFL).

Instructor of "2340: Objects and Design", May 2002–July 2002 and May 2005–July 2005, at Georgia Institute of Technology.

Teaching assistant, August 1997–May 2005, at Georgia Institute of Technology. I assisted with several classes, including "2340: Objects and Design", "4240: Compilers, Interpreters and Program Analyzers", and "4804: Introduction to Computing Concepts for Bioinformatics".

Teacher of high school geometry and pre-calculus, March 1997–May 1997, at Christ Church Episcopal School in Greenville, S.C.