

Donna M. Malayeri

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Citizenship: USA

Interests

Improving programming tools and environments to increase programmer productivity and to improve code quality; static analysis to catch bugs early

Languages

Java, Scala, C#, C++

Education

Ph.D. computer science, Carnegie Mellon University, September 2009.
Thesis topic: language support for unanticipated object-oriented reuse Advisor: Jonathan Aldrich

M.S. computer science, Carnegie Mellon University, 2005.

B.S. computer science, University of Maryland, College Park, 2001. GPA: 3.8 Major GPA: 3.9

Experience

October 2009–present Postdoctoral Researcher, EPFL (Lausanne, Switzerland)

Working on Scala, a programming language with full Java interoperability and a strong type system. Estimated 100,000 programmers worldwide; used by Twitter, FourSquare and others.

- Improving stability and performance of the Scala plugin for Eclipse.
- Implementing an improved debugger for the Scala Eclipse plugin, including innovative integration with the REPL (read-evaluate-print-loop).
- Designing and implementing new language features within a large, complex codebase. New features help reduce boilerplate code and involve changes to all compilation phases.
- Performed usability study on Scaladoc; improved visual layout and design.

June 2007–Aug 2007 Software Engineering Intern, Google Inc. (Kirkland, WA)

- Worked on project which used the Rhino JavaScript-to-Java compiler to run server-side JavaScript embedded within HTML pages (modeled on Ruby on Rails).
- Designed and implemented a full-fledged Eclipse debugger front- and backend for Rhino.
- Features included conditional breakpoints, expression evaluator, and ability to step in to HTML pages with server-side JavaScript.
- Instrumented existing programming environment to support the new language syntax. Added support for auto-completion and other advanced IDE features while editing server-side code.
- Contributed enhancements to Rhino compiler.

June 2003–Aug 2003 Research Intern, Microsoft Research (Redmond, WA)

- Development on the Fugue software protocol checker, a tool for ensuring that programs correctly maintain object state invariants.
- Designed annotations for specifying object invariants on exceptional control flow paths.
- Implemented new analyses for assuring correctness of exception-handling code.

Aug 2001–Aug 2002 Software Engineer, TRW Inc. (Reston, VA)

- Software developer on large C++ codebase for battlefield simulation.
- Involved in implementation, test, and off-site deployment of the software.
- Received three company excellence awards.

Apr 2000–Aug 2000 Software Developer Intern, RWD Technologies (Columbia, MD)

- Designed and implemented three-tier system using Swing, JDBC and EJB.
- Specified features to show traceability from requirements to design.
- Worked with client to clarify requirements and validate design prototypes.

Jan 1999–Feb 2000 Software Engineer, TarNegar Inc. (Tehran, Iran)

- Designed, implemented, and tested Visual C++ client and server telephony applications.

Research

2002–2009 Graduate assistant, Carnegie Mellon University, Computer Science Department

- Designed a new, statically-typed language to allow safely adapting code without modifying it directly. Language includes features which previously required dynamic typechecking.
- Performed an empirical study of existing Java programs. Results showed that new language could eliminate many runtime checks and would make programs easier to maintain.
- Designed and implemented a Java extension with a novel multiple inheritance mechanism, to help eliminate code duplication and promote reuse of library code.
- Redesigned Java exception specifications to reduce annotation overhead. Implemented a language extension and tool for specifying and enforcing exception policies.

Inventions

Modeling and Analysis Techniques for Software Assurance. William L. Scherlis, Jonathan Aldrich, Edwin Chan, Dean Sutherland, and Donna Malayeri. Invention Disclosure, June 2006

Publications

Gilles Dubochet and Donna Malayeri. Improving API Documentation for Java-like Languages. In Workshop on Evaluation and Usability of Programming Languages and Tools, October 2010.

Donna Malayeri and Jonathan Aldrich. CZ: Multiple Inheritance Without Diamonds. In *Proceedings of Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)*, 2009.

Donna Malayeri and Jonathan Aldrich. Is Structural Subtyping Useful? An Empirical Study. In *Proceedings of European Symposium on Programming (ESOP)*, 2009.

Donna Malayeri and Jonathan Aldrich. Integrating nominal and structural subtyping. In *Proceedings of European Conference on Object-Oriented Programming (ECOOP)*, 2008.

Donna Malayeri and Jonathan Aldrich. Practical exception specifications. In *Advanced Topics in Exception Handling Techniques*, volume 4119 of *LNCS*. Springer, 2006.

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