Mark Shields

Coordinates	mshields822@gmail.com, GitHub, LinkedIn, Resume, Based in Mapleleaf, Seattle.

Strengths	Strong analytical thinker. Able to find the hidden order and structure in apparent chaos and accidental complexity. Strong communicator over verbal, written, and presentation forms. Technical leadership over small teams. Biased towards action. Wide ranging technology background spanning languages and type systems, compilers, program optimization, program analysis, huge dataset processing pipelines, geograhic databases, geocoding, microarchitecture, basic electronics. Java, Scala, C#, JavaScript, OCaml, Haskell, C++, MapReduce.

Work

Jun 2016-Present	*Sabbatical.* Bayesian statistics, machine learning, systems biology.
Jul 2015-May 2016	*Developer, Google (Cloud).* Helped launch Google Cloud Dataflow (Streaming). Established benchmark suites. Made many performance, concurrency, correctness and semantics improvements. Onboarded customers. Helped transition SDK to Apache 'Beam' project. Java, C++, Google Compute Engine, Distributed and concurrent programming. A little Spark, Flink and Scala.
Apr 2011-Jul 2015	*Developer/Tech Lead/Manager, Google (Maps).* Pioneered model-based data repair to improve geocoding and business listing locations. Built the pipeline which merges auto-transcribed street numbers into base maps data. Built and managed a team of six engineers. Java, MapReduce, custom algorithms, massive datasets and batch processing.
Aug 2010-Mar 2011	*Senior Developer, Microsoft (DevDiv).* Worked on the new 'Chakra' JavaScript engine of Internet Explorer 9. Wrote the new regular-expression engine. C++.
Jun 2007-Aug 2010	*Senior Developer, Microsoft (SQL).* Built an optimizing compiler to transpile MSIL to JavaScript, and implemented the corresponding runtime. (Think GWT, but for the Microsoft stack.) Implemented updatable views on SQL backend via C# LINQ. C#, JavaScript.
Jan 2006-May 2007	*Program Manager, Microsoft (XML).* Prototyped a datamodeling language combining relational and XSD concepts in a stratified way.
Jul 2002-Dec 2006	*Applied research scientist, Galois Connections, Portland, Oregon.* Developed new consulting business with various defense clients.

	Designed and prototyped a multilevel web server with a custom security policy. Designed and developed a certifying compiler for a domain specific language for block-cipher cryptographic algorithms on custom hardware and implemented its runtime in C. Haskell, OCaml, C.
Apr 2002-May 2002	*Research Fellow, Department of Computer Science, Melbourne University, Australia.* Research in static analysis.
Feb 2001-Apr 2002	*Post-doctoral researcher, Microsoft Research, Cambridge, United Kingdom.* Researched and published in advanced type systems for functional programming languages.
Feb 1996-Feb 2001	*PhD Student in Computing Science, Oregon Graduate Institute, University of Glasgow, Sydney Institute of Technology.*
1994-1995	*Bachelor of Science Honors Student in Computing Science, University of Melbourne, Australia.*
Sep 1993-Mar 1995	*Software Engineer, Australian Bionic Ear and Hearing Research Institute, Melbourne, Australia.* Worked on an implant programming system.
Apr 1992-Aug 1993	*Software Engineer, Systematix Pty Ltd, Melbourne, Australia.* C++ programming for financial schedule optimization software.
Aug 1991-Apr 1992	*Software Engineer, Co-Cam Computer Group, Melbourne, Australia.* C programming for financial information systems.
Mar 1989-Aug 1991	*Software Engineer, Systematix Pty Ltd, Melbourne, Australia.* Business programming.
Jun 1988-Mar 1989	*Programmer, Arthur Andersen & Co, Melbourne, Australia.* Business programming.
1987-1990	*Bachelor of Science in Computer Science, Monash University, Australia.*

Papers and Preprints

2007	Practical type inference for arbitrary-rank types. Simon Peyton Jones, Dimitrios Vytiniotis, Stephanie Weirich, and Mark Shields. JFP 17(1).
2006	A verifying core for a cryptographic language compiler. Lee Pike, Mark Shields, John Matthews. In ACL2'06.
2006	A language for symmetric-key cryptographic algorithms and its efficient implementation. Mark Shields. Galois Connections Technical Report.
2002	Lexically-scoped type variables. Simon Peyton Jones and Mark Shields. Unpublished.
2002	A compiler writer's guide to C#. Mark Shields. Lecture notes.

2002	First-class modules for Haskell. Mark Shields and Simon Peyton Jones. In FOOL 9.
2001	Object-Oriented style overloading for Haskell. Mark Shields and Simon Peyton Jones. In BABEL'01.
2001	Static types for dynamic documents. Mark Shields. PhD Thesis.
2001	Type-Indexed Rows. Mark Shields and Erik Meijer. In POPL'01.
2000	XMLambda: A functional programming language for constructing and manipulating XML documents. Erik Meijer and Mark Shields. Unpublished.
2000	Implicit parameters: Dynamic scoping with static types. Jeffrey Lewis, Mark Shields, Erik Meijer and John Launchbury. In POPL'00.
1998	Dynamic typing as staged type inference. Mark Shields, Tim Sheard and Simon Peyton Jones. In POPL'98.
1998	Bridging the gulf: A common intermediate language for ML and Haskell. Simon Peyton Jones, John Launchbury, Mark Shields and Andrew Tolmach. In POPL'98. Corrigendum.

Education

Feb 2001	Ph.D. in Computing Science, Oregon Graduate Institute, USA.
Mar 1996	B.Sc. (hons), University of Melbourne, Australia.
Mar 1991	B.Sc., Monash University, Australia.

Last updated 15-Sep-2016.