Mark Shields PhD

Coordinates	mshields822@gmail.com, GitHub, LinkedIn, Based in Seattle.
Strengths	Wide technology experience in huge geographic data processing pipelines, distributed and concurrent systems, languages and type systems, compilers, electronics. Experienced technical leader over small teams. Strong analytical thinker and communicator. C++, Java, MapReduce, BigData, ML, Scala, C#, JavaScript, OCaml, Haskell.
	Work
Dec 2016-Present	*Developer, Google (Maps).* Built out a new telemetry, analysis and metrics system for Google Maps for Mobile. Helped feed analysis output back into product quality improvements for route selection. This system now actively detects and repairs maps issues which cause 'deviations'. Managed team which replace heuristic guidance systems with machine learned models. Now working on customizable routing for enterprise users of the Google Maps API and improving our ability to learn routes user's prefer to follow.
Jun 2016-Nov 2016	*Sabbatical.* Took some time of to catch up on statistical programming, Bayesian statistics and ML.
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. 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 consumes auto-transcribed street numbers into the base map database. 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 (SQL).* Prototyped datamodeling language combining relational and XSD concepts.
Jul 2002-Dec 2006	*Applied research scientist, Galois Inc, Portland, Oregon.* Startup. Developed new consulting business with various defense clients. Multi-level security system design for verifiablity. Built a certifying compiler and its runtime for a domain specific language for block-cipher cryptographic algorithms on custom verified hardware. 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.* Research 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.* Programming support for implant customization. C++.
Apr 1992-Aug 1993	*Software Engineer, Systematix Pty Ltd, Melbourne, Australia.* Startup. Cash delivery optimization software. C++.
Aug 1991-Apr 1992	*Software Engineer, Co-Cam Computer Group, Melbourne, Australia.* Real-time financial information systems. C.

Mar 1989-Aug 1991	*Software Engineer, Systematix Pty Ltd, Melbourne, Australia.* Startup. 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.

As PDF. As HTML at http://mshields822.github.io. Last updated 20-Oct-2019.