## Mark Shields PhD

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| **Coordinates** | mshields822@gmail.com, GitHub, LinkedIn, Based in Seattle. |
| **Strengths** | Wide technology experience in distributed and concurrent systems, huge geographic data processing pipelines, languages and type systems, compilers, electronics.<br>Experienced technical leader over small teams.<br>Strong analytical thinker and communicator.<br>Java, Scala, C#, JavaScript, OCaml, Haskell, C++, MapReduce, BigData, ML 101. |
| | **Work** |
| **Jun 2016-Present** | *Sabbatical.* Explored a startup idea. Embedded a small Bayesian modelling language inspired by Stan in Scala with Variational Bayes for posterior inference. A great learning vehicle for basic Bayesian statistics and Machine Learning. |
| **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 |

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| | 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 17-Oct-2016.