

Faculty of Computer, Communication,
and Information Science
EPFL
Station 14
1015 Lausanne
Switzerland

Phone: +41 78 625 20 23
Fax: +41 21 693 66 60
heather.miller@epfl.ch
<http://heather.miller.am>

HEATHER MILLER

Citizenship	USA	
Education	<i>EPFL, Lausanne, Switzerland</i>	2009 –
	Ph.D. in Computer Science	
	Advisor: Martin Odersky	2011 –
	<i>University of Miami, Coral Gables, FL</i>	2006 – 2009
	BSEE in Electrical Engineering, Audio Engineering, <i>with honors</i> , May 2009	
	<i>Cooper Union for the Advancement of Science and Art, New York, NY</i>	2004 – 2006
Professional Experience	Research Intern, Databricks, Berkeley, CA, USA	8/2014 – 11/2014
	Supervisor: Matei Zaharia	
	Integrated Scala Pickling, our framework for fast, boilerplate-free, extensible serialization focused on distributed programming (OOPSLA'13) into Spark.	
	Developed new function-passing programming model and framework, can be thought of as a generalization of Spark/MapReduce programming model.	
Teaching Experience	Lecturer, Co-Designer, Reactive Programming & Parallelism	2015
	EPFL Undergraduate course on parallel, distributed, and asynchronous programming (~90 students)	
	Lecturer, Co-Designer, Parallel Programming & Data Analysis	2015
	Upcoming Coursera MOOC on parallel, distributed, and asynchronous programming.	
	Lead, Functional Programming Principles in Scala	2012 – 2014
	Popular Coursera MOOC on functional programming in Scala, with >200,000 participants to date & largest completion rate for a course its size (~19%)	
	<ul style="list-style-type: none"> • Lead teaching staff organizing a team of graduate students, managing content production, designed course exercises with cloud-hosted grading, production of lecture videos, etc • Created extensive course analysis with interactive visualizations; led to a publication at ICSE'14 	
	(Lead) Teaching Assistant, Programming Principles	2011-2014
	Required EPFL undergraduate course on functional & logic programming (~160 students)	
	Instructor, Scala as a Research Tool	2013
	ECOOP Tutorial	

Research Interests	Concurrent, distributed, data-centric, and data-intensive (big data) programming, from the perspective of programming languages. I work on both theoretical ideas & implementations for the Scala programming language which seek to make it easier to build distributed systems.	
Publications	Distributed Programming via Safe Closure Passing Philipp Haller, Heather Miller <i>Programming Language Approaches to Communication and Concurrency Centric Systems</i>	<i>PLACES 2015</i>
	Spores: A Type-Based Foundation for Closures in the Age of Concurrency and Distribution Heather Miller, Philipp Haller, Martin Odersky <i>European Conference on Object Oriented Programming</i>	<i>ECOOP 2014</i>
	Functional Programming For All! Scaling a MOOC for Students And Professionals Alike Heather Miller, Philipp Haller, Lukas Rytz, Martin Odersky <i>ACM SIGSOFT International Conference on Software Engineering</i>	<i>ICSE 2014</i>
	Instant Pickles: Generating Object-Oriented Pickler Combinators for Fast and Extensible Serialization Heather Miller, Philipp Haller, Eugene Burmako, Martin Odersky <i>ACM SIGPLAN Conference on Object Oriented Programming, Systems, Languages and Applications</i>	<i>OOPSLA 2013</i>
	RAY: Integrating Rx and Async for Direct-Style Reactive Streams Philipp Haller, Heather Miller <i>ACM SPLASH Workshop on Reactivity, Events and Modularity</i>	<i>REM 2013</i>
	FlowPools: A Lock-Free Deterministic Concurrent Dataflow Abstraction Aleksandar Prokopec, Heather Miller, Tobias Schlatter, Philipp Haller, Martin Odersky <i>International Workshop on Languages and Compilers for Parallel Computing</i> Invited to Revised Selected Papers on the 25th International Workshop on Languages and Compilers for Parallel Computing, Lecture Notes in Computer Science, Vol. 7760, 2013	<i>LCPC 2012</i>
	Tools and Frameworks for Big Learning in Scala: Leveraging the Language for High Productivity and Performance Heather Miller, Philipp Haller, Martin Odersky <i>NIPS Workshop on Parallel and Large-Scale Machine Learning</i>	<i>BigLearn 2011</i>
	Parallelizing Machine Learning – Functionally: A Framework and Abstractions for Parallel Graph Processing Philipp Haller, Heather Miller <i>Scala Workshop</i>	<i>Scala 2011</i>

Submitted/In Preparation	Function Passing: A Model for Typed, Distributed Functional Programming Heather Miller, Philipp Haller	
	Self-Assembly: Lightweight Language Extension and Datatype Generic Programming, All-in-One! Heather Miller, Philipp Haller, Bruno C. d. S. Oliveira	
	Improving Human-Compiler Interaction Through Customizable Type Feedback Hubert Plociniczak, Heather Miller, Martin Odersky	
Selected Tech Reports	Spores, Formally Heather Miller, Philipp Haller <i>December 2013</i>	
	FlowPools: A Lock-Free Deterministic Concurrent Dataflow Abstraction – Proofs Aleksandar Prokopec, Heather Miller, Philipp Haller <i>June 2012</i>	
Open Source	Scala Programming Language, member of the Scala team	2011 –
	<ul style="list-style-type: none"> • Scala Spores (Scala Improvement Proposal SIP-21), project lead novel type-based abstraction for using closures safely in concurrent and distributed environments 	
	<ul style="list-style-type: none"> • Scala Pickling, project lead novel framework for fast, boilerplate-free, extensible serialization. Adopted by sbt, the most widely-used build tool for Scala. Popular open-source project on GitHub with >480 stars & dozens of contributors 	
	<ul style="list-style-type: none"> • Scala Futures & Promises (Scala Improvement Proposal SIP-14), team member unified non-blocking concurrency substrate for Scala, Akka, Play, and others 	
	<ul style="list-style-type: none"> • Scala Documentation, creator, writer, lead maintainer a central website for community-driven documentation for the Scala programming language and core libraries 	
	<ul style="list-style-type: none"> • Scaladoc, co-maintainer documentation tool for Scala's official API documentation 	
Honors	US National Science Foundation Graduate Research Fellowship	2011 – 2014
	EPFL Outstanding Teaching Award	2012
	EPFL Computer Science Fellowship	2009 – 2010
	Most Outstanding Audio Engineering Student, University of Miami	2009
	Most Outstanding Eta Kappa Nu Student, University of Miami	2009
	Information Technology Scholarship, University of Miami	2006 – 2009
	John Farina Family Scholarship, University of Miami	2006 – 2009
	Eta Kappa Nu	2008
	Tau Beta Pi	2008
	SMART US Department of Defense Scholarship Alternate	2007
	Cooper Union Full Tuition Scholarship	2004 – 2006

Selected Talks	Function Passing Style: Typed, Distributed Functional Programming St. Louis, MO, USA. September 19, 2014	<i>Strange Loop 2014</i>
	Spores: A Type-Based Foundation for Closures in the Age of Concurrency and Distribution Uppsala, Sweden. August 1, 2014	<i>ECOOP 2014</i>
	Functional Programming For All! Scaling a MOOC for Students and Professionals Alike Hyderabad, India. June 4, 2014	<i>ICSE 2014</i>
	Academese to English: Scala's Type System, Dependent Types and What It Means To You New York, NY, USA. March 1, 2014	<i>NEScala 2014</i>
	Instant Pickles: Generating Object-Oriented Pickler Combinators for Fast and Extensible Serialization Indianapolis, IN, USA. October 30, 2013	<i>OOPSLA 2013</i>
	PL Abstractions for Distributed Programming: Pickle Your Spores! Bloomington, IN, USA. October 25, 2013	<i>Indiana University (invited)</i>
	Spores: Distributable Functions in Scala St. Louis, MO, USA. September 19, 2013	<i>Strange Loop 2013</i>
	Open Issues in Dataflow Programming Montpellier, France. July 1, 2013	<i>LaME 2013 (invited)</i>
	Scala as a Research Tool Montpellier, France. July 1, 2013	<i>ECOOP 2013 Tutorial</i>
	On Pickles & Spores: Improving Scala's Support for Distributed Programming New York, NY, USA. June 12, 2013	<i>ScalaDays 2013</i>
	Futures & Promises in Scala 2.10 Philadelphia, PA, USA. April 2, 2013	<i>PhillyETE 2013 (invited)</i>
	<i>I am also a frequent speaker in industry, at industrial conferences, developer “meet-ups”, and everything in between. Some such events include:</i>	
	<i>f(by)</i> (11/2014, Minsk, Belarus), <i>SF Scala</i> (11/2014, SF, USA), <i>Scalapeño</i> (9/2014, Tel Aviv, Israel), <i>SoundCloud TechTalks</i> (7/2014, Berlin, Germany), <i>Scala Days</i> (6/2014, Berlin, Germany), <i>NEScala</i> (3/2014, NYC, USA), amongst others.	
External Activities	Hacker School , resident	2015
	Scalawags Monthly Podcast , co-host	2014 –

External Service

Curry On 2015, organizer (co-chair)	7/2015
ECOOP 2015, organizing committee member (sponsorship)	7/2015
PLE 2015, program committee member	7/2015
DSLDI 2015, program committee member	7/2015
Scala Symposium 2015, organizer (co-chair)	6/2015
POPL 2015, artifact evaluation committee member	1/2015
Scala Workshop 2014, organizer (co-chair)	7/2014
Scala Workshop 2013, organizer (co-chair)	7/2013
External Reviewer for: ECOOP 2013, Scala 2013	
Editor of proceedings for: Scala 2015, Scala 2014, Scala 2013	

Students Supervised¹

Louis Bliss , <i>Incremental Picklers for Scala Pickling</i> M.Sc. level, co-supervision with Philipp Haller	9/2013 – 1/2014
Thaddée Yann Tyl , <i>Learning Scala Style</i> M.Sc. thesis	2/2013 – 6/2013
Tobias Schlatter , <i>FlowSeqs: Barrier-Free ParSeqs</i> M.Sc. level, co-supervision w/ Philipp Haller & Aleksandar Prokopec	9/2012 – 1/2013
Tobias Schlatter , <i>Multi-Lane FlowPools</i> M.Sc. level, co-supervision w/ Philipp Haller & Aleksandar Prokopec	2/2012 – 6/2012
Pierre Grydbeck , <i>Parallel Machine Learning: An Expectation Maximization Algorithm for Gaussian Mixture Models</i> M.Sc. level, co-supervision with Philipp Haller	2/2012 – 6/2012
Bruno Studer , <i>Parallel Machine Learning: Collaborative Filtering via Alternating Least Squares</i> B.Sc. level, co-supervision with Philipp Haller	2/2012 – 6/2012
Stanislav Peshterliev , <i>Parallel Natural Language Processing Algorithms in Scala</i> M.Sc. level, co-supervision with Philipp Haller	9/2011 – 1/2012
Olivier Blanvillain & Louis Bliss , <i>Parallelization of a Collaborative Filtering Algorithm with Menthor</i> B.Sc. level, co-supervision with Philipp Haller	9/2011 – 1/2012
Florian Gysin , <i>Improving Parallel Graph Processing Through the Introduction of Parallel Collections</i> M.Sc. level, co-supervision with Philipp Haller	9/2011 – 1/2012
Georges Discry , <i>Extending the Menthor Framework for Parallel Graph Processing to Distributed Computing</i> M.Sc. level, co-supervision with Philipp Haller	2/2011 – 6/2011

¹ At EPFL, research groups offer substantial projects for B.Sc./M.Sc. students to complete for credit. EPFL PhD students design and supervise these projects, as well as M.Sc. thesis projects.

References

Martin Odersky

Faculty of Computer, Communication, and Information Science
École Polytechnique Fédérale de Lausanne

☎ +41 21 693 68 63

✉ martin.odersky@epfl.ch

Philipp Haller

School of Computer Science and Communication
KTH Royal Institute of Technology

☎ +41 76 205 39 32

✉ phaller@kth.se

Matei Zaharia

Department of Electrical Engineering and Computer Science
Massachusetts Institute of Technology

☎ +1-510-610-0001

✉ matei@mit.edu

Marius Eriksen

Twitter

✉ marius@twitter.com