

Faculty of Computer, Communication,
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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 Heather Miller, Philipp Haller <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 Style: 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, <i>member of the Scala team</i>	2011 –
	<ul style="list-style-type: none"> • Scala Spores (Scala Improvement Proposal SIP-21), <i>project lead</i> novel type-based abstraction for using closures safely in concurrent and distributed environments • Scala Pickling, <i>project lead</i> 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 • Scala Futures & Promises (Scala Improvement Proposal SIP-14), <i>team member</i> unified non-blocking concurrency substrate for Scala, Akka, Play, and others • Scala Documentation, <i>creator, writer, lead maintainer</i> a central website for community-driven documentation for the Scala programming language and core libraries • Scaladoc, <i>co-maintainer</i> 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

Committees:

DSLDI (PC Member)	7/2015
ECOOP 2015 organizing committee (sponsorship)	7/2015
Curry On Prague (co-chair)	7/2015
Scala Symposium 2015 (Scala'15) (co-chair)	6/2015
POPL 2015 AEC	10/2014
Scala Workshop 2014 (Scala'14) (co-chair)	7/2014
Scala Workshop 2013 (Scala'13) (co-chair)	7/2013

External Reviewer for: ECOOP 2013, Scala 2013

Editor of proceedings for: Scala 2013, Scala 2014, Scala 2015

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

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