

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
Research Interests	Programming language support for concurrent and distributed programming; type systems; language and library design; reactive programming
Education	<p><i>EPFL, Lausanne, Switzerland</i> 2009 – Ph.D. in Computer Science Advisor: Martin Odersky 2011 –</p> <p><i>University of Miami, Coral Gables, FL</i> 2006 – 2009 BSEE in Electrical Engineering, Audio Engineering, <i>with honors</i>, May 2009</p> <p><i>Cooper Union for the Advancement of Science and Art, New York, NY</i> 2004 – 2006</p>
Academic Service	<p><b>Committees:</b> ECOOP 2015 organizing committee (sponsorship chair), POPL 2015 AEC, Scala 2014 (co-chair), Scala 2013 (co-chair) <b>Reviewer for:</b> ECOOP 2013, Scala 2013</p>
Publications	<p><b>Spores: A Type-Based Foundation for Closures in the Age of Concurrency and Distribution</b> ECOOP 2014 Heather Miller, Philipp Haller, Martin Odersky <i>European Conference on Object Oriented Programming</i></p> <p><b>Functional Programming For All! Scaling a MOOC for Students And Professionals Alike</b> ICSE 2014 Heather Miller, Philipp Haller, Lukas Rytz, Martin Odersky <i>ACM SIGSOFT International Conference on Software Engineering</i></p> <p><b>Instant Pickles: Generating Object-Oriented Pickler Combinators for Fast and Extensible Serialization</b> OOPSLA 2013 Heather Miller, Philipp Haller, Eugene Burmako, Martin Odersky <i>ACM SIGPLAN Conference on Object Oriented Programming, Systems, Languages and Applications</i></p> <p><b>RAY: Integrating Rx and Async for Direct-Style Reactive Streams</b> REM 2013 Philipp Haller, Heather Miller <i>Workshop on Reactivity, Events and Modularity</i></p>

### FlowPools: A Lock-Free Deterministic Concurrent Dataflow Abstraction

LCPC 2012

Aleksandar Prokopec, Heather Miller, Tobias Schlatter,  
Philipp Haller, Martin Odersky

*International Workshop on Languages and Compilers for Parallel Computing*

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

### Tools and Frameworks for Big Learning in Scala: Leveraging the Language for High Productivity and Performance

BigLearn 2011

Heather Miller, Philipp Haller, Martin Odersky

*NIPS Workshop on Parallel and Large-Scale Machine Learning*

### Parallelizing Machine Learning – Functionally: A Framework and Abstractions for Parallel Graph Processing

Scala 2011

Philipp Haller, Heather Miller

*Scala Workshop*

## Awards

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

## Teaching Experience

**Lead Teaching Assistant**, *Functional Programming Principles in Scala*

2012 – 2014

Popular Coursera MOOC on functional programming in Scala, with >100,000 participants to date

- Lead TA organizing a team of graduate students, editing lecture videos, managing content production, designed course exercises with cloud-hosted grading, etc
- Created extensive course evaluations with interactive visualizations; led to a publication at ICSE'14

**Instructor**, *Scala as a Research Tool*

2013

ECOOP Tutorial

**Lead Teaching Assistant**, *Programming Principles*

2012

EPFL Undergraduate course on functional and logic programming

Teaching Assistant, *Programming Principles* 2011  
EPFL Undergraduate course on functional and logic programming

**Open Source** **Scala Programming Language**, *member of the Scala team* 2011 –

- **Scala Spores** (Scala Improvement Proposal SIP-21), *project lead*  
novel type-based abstraction for using closures safely  
in concurrent and distributed environments
- **Scala Pickling**, *project lead*  
novel framework for fast, boilerplate-free, extensible serialization
- **Scala Futures and Promises** (Scala Improvement Proposal SIP-14), *team member*  
unified non-blocking concurrency substrate for  
Scala, Akka, Play, and others
- **Scala Documentation**, *creator, writer, lead maintainer*  
a central website for community-driven documentation for  
the Scala programming language and core libraries
- **Scaladoc**, *co-maintainer*  
documentation tool for Scala's official API documentation

**Selected Talks** **Academese to English: Scala's Type System, Dependent Types** *NEScala 2014*  
**and What It Means To You**  
New York, NY, USA. March 1, 2014

**Instant Pickles: Generating Object-Oriented Pickler** *OOPSLA 2013*  
**Combinators for Fast and Extensible Serialization**  
Indianapolis, IN, USA. October 30, 2013

**PL Abstractions for Distributed Programming:** *Indiana University (invited)*  
**Pickle Your Spores!**  
Bloomington, IN, USA. October 25, 2013

**Spores: Distributable Functions in Scala** *Strange Loop 2013*  
St. Louis, MO, USA. September 19, 2013

**Open Issues in Dataflow Programming** *LaME 2013 (invited)*  
Montpellier, France. July 1, 2013

**Scala as a Research Tool** *ECOOP 2013 Tutorial*  
Montpellier, France. July 1, 2013

**On Pickles & Spores: Improving Scala's Support** *ScalaDays 2013*  
**for Distributed Programming**  
New York, NY, USA. June 12, 2013

**Futures & Promises in Scala 2.10** *PhillyETE 2013 (invited)*  
Philadelphia, PA, USA. April 2, 2013

Selected  
Broader  
Impacts

**EPFL Computer Science Faculty Council, PhD Student Representative** 2012 –  
Members include the dean of the college as well as representatives from every branch of the college, administrative, PhD, faculty, etc. Quarterly meetings to steer the college and introduce new initiatives.

**EPFL CS Graduate Student Association, President** 2009 – 2011  
Volunteer student organization with a mission to foster a sense of community and collaboration between different research groups in the college. Initiatives led/introduced:

- **Research Day:** college-wide showcase of labs' research activities
- **PhD Student Open House:** main recruiting event for CS doctoral program
- **Social Events:** aperós, ski trips, outings

**EPFL CS Graduate Student Mentor** 2010 – 2012  
One-on-one mentoring of incoming doctoral students, aided students in integrating into EPFL's research environment and Switzerland as a whole.

Students  
Supervised

**Louis Bliss, Incremental Picklers for Scala Pickling** 9/2013 – 1/2014  
M.Sc. Level, co-supervision with Philipp Haller

**Thaddée Yann Tyl, Learning Scala Style** 2/2013 – 6/2013  
M.Sc. thesis

**Tobias Schlatter, FlowSeqs: Barrier-Free ParSeqs** 9/2012 – 1/2013  
M.Sc. level, co-supervision w/ Philipp Haller & Aleksandar Prokopec

**Tobias Schlatter, Multi-Lane FlowPools** 2/2012 – 6/2012  
M.Sc. level, co-supervision w/ Philipp Haller & Aleksandar Prokopec

**Pierre Grydbeck, Parallel Machine Learning: An Expectation Maximization Algorithm for Gaussian Mixture Models** 2/2012 – 6/2012  
M.Sc. level, co-supervision with Philipp Haller

**Bruno Studer, Parallel Machine Learning: Collaborative Filtering via Alternating Least Squares** 2/2012 – 6/2012  
B.Sc. level, co-supervision with Philipp Haller

**Stanislav Peshterliev, Parallel Natural Language Processing Algorithms in Scala** 9/2011 – 1/2012  
M.Sc. level, co-supervision with Philipp Haller

**Olivier Blavillain & Louis Bliss, Parallelization of a Collaborative Filtering Algorithm with Menthor** 9/2011 – 1/2012  
B.Sc. level, co-supervision with Philipp Haller

**Florian Gysin, Improving Parallel Graph Processing Through the Introduction of Parallel Collections** 9/2011 – 1/2012  
M.Sc. level, co-supervision with Philipp Haller

**Georges Discry**, *Extending the Menthor Framework for Parallel  
Graph Processing to Distributed Computing*  
M.Sc. level, co-supervision with Philipp Haller

2/2011 – 6/2011