

Peter Bailis

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Revised 03/2018

RESEARCH INTERESTS

Data management, data-intensive computing, distributed systems

EDUCATION

University of California, Berkeley 2011-2015
PhD in Computer Science.
Advisors: Ali Ghodsi, Joseph M. Hellerstein, Ion Stoica

Harvard College 2007-2011
AB in Computer Science.
Magna cum laude with Highest Honors in Computer Science

RESEARCH EXPERIENCE

Assistant Professor 2016-Present
Stanford University Computer Science Department Stanford, CA

Postdoctoral Researcher Nov. 2015-Apr. 2016
MIT Computer Science and Artificial Intelligence Lab Cambridge, MA

Graduate Student Researcher 2011-2015
UC Berkeley Computer Science Division Berkeley, CA

Undergraduate Researcher 2009-2011
Harvard College Cambridge, MA

AWARDS and HONORS

Facebook Hardware & Software Systems Research Award, 2018
ACM SIGMOD Jim Gray Doctoral Dissertation Award, 2017
Okawa Foundation Grant, 2017
Google Faculty Research Award, 2017
NetApp Faculty Fellowship, 2017
ACM Doctoral Dissertation Award, Honorable Mention, 2016
VISA Faculty Award, 2016
Facebook Faculty Award, 2016
VMWare Early Career Faculty Award, 2016
Stanford David Morganthaler II Faculty Fellow, 2016-2018
Forbes "30 Under 30" in Enterprise Technology, 2016
UC Berkeley EECS David J. Sakrison Memorial Prize, 2015
UC Berkeley Outstanding Graduate Student Instructor Award, 2014

National Science Foundation Graduate Research Fellowship, 2011-2016
Berkeley Fellowship for Graduate Study, 2011-2014
UC Berkeley EECS Chair's Excellence Award, 2011-2012
Computing Research Association Outstanding Undergraduate Researcher, 2011
Thomas Temple Hoopes Prize for Outstanding Senior Thesis, 2011
Phi Beta Kappa, Harvard College Chapter, inducted 2011
Derek Bok Center Certificate for Distinction in Teaching, 2009

Paper Awards

"Best of SIGMOD 2017" invitation to ACM TODS
"Best of SIGMOD 2014" citation in ACM TODS
Communications of the ACM Research Highlight, 2014
"Best of VLDB 2012" citation in the VLDB Journal
Best Student Paper, ANTS 2010

PUBLICATIONS

Journal Articles

Peter Bailis, Alan Fekete, Ali Ghodsi, Joseph M. Hellerstein, and Ion Stoica. Scalable atomic visibility with RAMP transactions. *ACM TODS*, 2016. "Best of SIGMOD 2014" Special Issue.
Peter Bailis, Shivaram Venkataraman, Michael J. Franklin, Joseph M. Hellerstein, and Ion Stoica. Quantifying eventual consistency with PBS. *The VLDB Journal*, 23(2):279–302, 2014. "Best of VLDB 2012" Special Issue.

Refereed Conference Proceedings

Peter Bailis, Edward Gan, Samuel Madden, Deepak Narayanan, Kexin Rong, and Sahaana Suri. MacroBase: prioritizing attention in fast data. *ACM SIGMOD*, 2017.
Peter Bailis, Edward Gan, Kexin Rong, and Sahaana Suri. Prioritizing Attention in Fast Data: Challenges and Opportunities. *CIDR*, 2017.
Edward Gan and Peter Bailis. Scalable Kernel Density Classification via Threshold-Based Pruning. *ACM SIGMOD*, 2017.
Daniel Kang, John Emmons, Firas Abuzaid, Peter Bailis, and Matei Zaharia. NoScope: optimizing deep CNN-based queries over video streams at scale. *VLDB*, 2017.
Kexin Rong and Peter Bailis. ASAP: automatic smoothing for attention prioritization in streaming time-series data. *VLDB*, 2017.
Todd Warzsawski and Peter Bailis. ACIDRain: concurrency-related attacks on database-backed web applications. *ACM SIGMOD*, 2017.
Peter Bailis, Alan Fekete, Michael J. Franklin, Ali Ghodsi, Joseph M. Hellerstein, and Ion Stoica. Coordination avoidance in database systems. *VLDB*, 2015.
Peter Bailis, Alan Fekete, Michael J. Franklin, Ali Ghodsi, Joseph M. Hellerstein, and Ion Stoica. Feral concurrency control: An empirical investigation of modern application integrity. *ACM SIGMOD*, 2015.

Dan Crankshaw, Peter Bailis, Joseph E. Gonzalez, Haoyuan Li, Zhao Zhang, Michael J. Franklin, Ali Ghodsi, and Michael I. Jordan. The missing piece in complex analytics: Low latency, scalable model management and serving with Velox. *CIDR*, 2015.

Peter Bailis, Aaron Davidson, Alan Fekete, Ali Ghodsi, Joseph M. Hellerstein, and Ion Stoica. Highly Available Transactions: Virtues and limitations. *VLDB*, 2014.

Peter Bailis, Alan Fekete, Ali Ghodsi, Joseph M. Hellerstein, and Ion Stoica. Scalable atomic visibility with RAMP transactions. *ACM SIGMOD*, 2014.

Peter Alvaro, Peter Bailis, Neil Conway, and Joseph M. Hellerstein. Consistency without borders. *ACM SoCC*. Vision track, 2013.

Peter Bailis, Ali Ghodsi, Joseph M. Hellerstein, and Ion Stoica. Bolt-on causal consistency. *ACM SIGMOD*, 2013.

Peter Bailis, Alan Fekete, Ali Ghodsi, Joseph M. Hellerstein, and Ion Stoica. The potential dangers of causal consistency and an explicit solution. *ACM SoCC*. Vision track, 2012.

Peter Bailis, Shivaram Venkataraman, Michael J. Franklin, Joseph M. Hellerstein, and Ion Stoica. Probabilistically bounded staleness for practical partial quorums. *VLDB*, 2012.

Peter Bailis, Vijay Janapa Reddi, Sanjay Gandhi, David Brooks, and Margo Seltzer. Dimetrodon: Processor-level preventive thermal management via idle cycle injection. *DAC*, 2011.

Karthik Dantu, Bryan Kate, Jason Waterman, Peter Bailis, and Matt Welsh. Programming micro-aerial vehicle swarms with Karma. *ACM SenSys*, 2011.

Peter Bailis, Radhika Nagpal, and Justin Werfel. Positional communication and private information in honeybee foraging models. *ANTS*, 2010.

Conference Demonstrations

Peter Bailis, Edward Gan, Kexin Rong, and Sahaana Suri. Demonstration: MacroBase, A Fast Data Analysis Engine. *ACM SIGMOD*, 2017.

Peter Bailis, Shivaram Venkataraman, Michael J. Franklin, Joseph M. Hellerstein, and Ion Stoica. PBS at work: Advancing data management with consistency metrics. *ACM SIGMOD*, 2013.

Refereed Workshop Proceedings

Cody Coleman, Deepak Narayanan, Daniel Kang, Tian Zhao, Jian Zhang, Luigi Nardi, Peter Bailis, Kunle Olukotun, Chris Re, and Matei Zaharia. Dawnbench: an end-to-end deep learning benchmark and competition. *NIPS ML Systems Workshop*, 2017.

Joseph E. Gonzalez, Peter Bailis, Michael J. Franklin, Joseph M. Hellerstein, Michael I. Jordan, and Ion Stoica. Asynchronous complex analytics in a distributed dataflow architecture. *LearningSys (NIPS)*, 2015.

Peter Bailis, Alan Fekete, Ali Ghodsi, Joseph M. Hellerstein, and Ion Stoica. HAT, not CAP: Towards highly available transactions. *HotOS*, 2013.

Invited Articles

Peter Bailis et al. "Research for Practice" Column. *Communications of the ACM*, 2016-present. Bi-monthly column featuring pragmatically-focused research highlights from all of Computer Science.

Peter Bailis and Kyle Kingsbury. The network is reliable: An informal survey of real-world communications failures. *ACM Queue*, 12(7), 2014. Also appears in *Communications of the ACM* 57(9):48-55, September 2014.

Peter Bailis, Shivaram Venkataraman, Michael J. Franklin, Joseph M. Hellerstein, and Ion Stoica. Quantifying eventual consistency with PBS. *Communications of the ACM*, 57:93–102, 8, 2014.

Peter Bailis and Ali Ghodsi. Eventual Consistency today: Limitations, extensions, and beyond. *ACM Queue*, 11(3), 2013. Also appears in *Communications of the ACM* 56(3):55-63, May 2013.

Theses

Peter Bailis. Coordination avoidance in distributed databases. PhD Dissertation. University of California, Berkeley, 2015.

Peter Bailis. Dimetrodon: Processor-level preventive thermal management via idle cycle injection. Harvard College Undergraduate Honors Thesis. 2011.

Books

Peter Bailis, Joseph M. Hellerstein, and Michael Stonebraker, editors. *Readings in Database Systems, 5th Edition*, 2015. URL: <http://www.redbook.io/>.

SERVICE

Program Committees:

ACM SIGMOD (2019, 2018, 2017, 2016), VLDB (2019, 2018, 2017), HPTS (2017), ACM SoCC (2015)

Editor:

Research for Practice, appearing in *ACM Queue* and *CACM*

Editorial Board:

ACM Queue (2016-present)

Foundations and Trends in Databases (2015-present)

Organizing Committee:

SysML 2018

Steering Committee:

Workshop on Principles and Practice of Eventual Consistency (PaPEC, EuroSys 2014)

Workshop on Principles and Practice of Consistency (PaPoC, Eurosys 2015, 2016)

PhD STUDENTS

Firas Abuzaid, PhD CS, Stanford (co-advised with Matei Zaharia; 2015-present)

Cody Coleman, PhD CS, Stanford (co-advised with Matei Zaharia; 2017-present)

Edward Gan, PhD CS, Stanford (2016-present)

Daniel Kang, PhD CS, Stanford (co-advised with Matei Zaharia; 2017-present)

Peter Kraft, PhD CS, Stanford (2018-present)

Kexin Rong, PhD CS, Stanford (co-advised with Phil Levis; 2016-present)

Sahaana Suri, PhD EE, Stanford (2016-present)

Kai Sheng Tai, PhD CS, Stanford (2017-present)