Curriculum Vitae

Peter Alvaro

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Computer Science Department
University of California, Santa Cruz
1156 High Street, MS SOE3
Santa Cruz, CA 95064

PHONE: +1 (415) 813 9364
EMAIL: palvaro@ucsc.edu
http://people.ucsc.edu/~palvaro

EMPLOYMENT HISTORY

2015–	Assistant Professor, Computer Science Department, University of California, Santa Cruz
2016	Consultant, Uber Inc., San Francisco, CA
2015	Consultant, Netflix Inc., Los Gatos, CA
2008-2014	Research Assistant, Computer Science Division, University of California at Berkeley
1999-2008	Senior Software Engineer, Ask.com, Oakland, CA

EDUCATION

2015	Ph. D., University of California at Berkeley, Computer Science (advisor: Joseph M. Hellerstein) Thesis: *Data-centric Programming for Distributed Systems*
2010	M. S., University of California at Berkeley, Computer Science
1997	B. A, Middlebury College, English Literature, *magna cum laude*

HONORS AND AWARDS

2017	**NSF CAREER** Award: "Lineage-driven Fault Injection."
2017	**Keynote Speaker**, O'Reilly Velocity, San Jose, CA, 2017.
2016	**Keynote Speaker**, Reactive Summit, Austin, TX, 2016.
2016	**Keynote Speaker**, Qcon London 2016.
2015	**Keynote Speaker**, Strange Loop, Saint Louis, MO, September 2015.
2014	**Keynote Speaker**, Ricon, Las Vegas, NV, October 2014.
2010	**Graduate Research Fellow**, National Science Foundation
2009	**Finalist**, Qualcomm Innovation Fellowship
1997	**Phi Beta Kappa**, Middlebury College
1997	**Highest Honors** in English Literature, Middlebury College
1997	**Winner**, Reid L. Carr prize, Middlebury College

RESEARCH FUNDING

Grants

2017–2021	PI, *CAREER: Lineage-driven Fault Injection*, National Science Foundation, $475,000.

Gifts

2017	Facebook, $50,000.
2017	Huawei, Inc., $100,000.

SCHOLARLY AND CREATIVE WORK

NOTE: (*) denotes a student co-author, and (‡) denotes a student co-author who was one of my advisees.

Journals

J4. **Peter Alvaro**, Neil Conway, Joseph M. Hellerstein, David Maier, "Coordination Analysis and Placement for Distributed Programs", *Transactions on Database Systems (TODS)*, June 2017 (ACM).

J3. Tom J. Ameloot, Jan Van den Bussche, William R. Marczak, **Peter Alvaro**, and Joseph M. Hellerstein, "Putting logic-based distributed systems on stable grounds", *Theory and Practice of Logic Programming*, **16**(2), August 2015.

J2. Neil Conway, **Peter Alvaro**, Emily Andrews, and Joseph M Hellerstein, "Edelweiss: Automatic Storage Reclamation for Distributed Programming", *Proceedings of the VLDB Endowment (PVLDB 2014)*, **7**(6), February, 2014.

J1. **Peter Alvaro**, Tyson Condie, Neil Conway, Joseph M Hellerstein, and Russell Sears, "I do declare: consensus in a logic language", *ACM SIGOPS Operating Systems Review*, **43**(4), January 2010.

Refereed Conference & Workshop Papers

C16. Kamala Ramasubramanian[‡], Kathryn Dahlgren[‡], Asha Karim[‡], Sanjana Maiya[*], Sarah Borland[*], **Peter Alvaro**, "Growing a Protocol", *Proceedings of the 9th USENIX Workshop on Hot Topics in Cloud Computing (HotCloud 2017)*, Santa Clara, CA (USENIX), July 2017.

C15. Noah Watkins[*], Michael A. Sevilla[*], Ivo Jimenez[*], Kathryn Dahlgren[‡], **Peter Alvaro**, Shel Finkelstein, Carlos Maltzahn, "DeclStore: Layering is for the Faint of Heart", *Proceedings of the 9th USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage 2017)*, Santa Clara, CA (USENIX), July 2017.

C14. Michael A. Sevilla[*], Noah Watkins[*], Ivo Jimenez[*], **Peter Alvaro**, Shel Finkelstein, Jeff LeFevre, Carlos Maltzahn, "Malacology: A Programmable Storage System", *Proceedings of the 12th European conference on Computer systems (Eurosys 2017)*, Belgrade, Serbia, April, 2017.

C13. **Peter Alvaro**, Kolton Andrus, Chris Sanden, Casey Rosenthal, Ali Basiri, Lorin Hochstein, "Automating Failure Testing Research at Internet Scale", *Proceedings of the 7th Annual Symposium on Cloud Computing (SoCC 2016)*, Santa Clara, CA: ACM, October, 2016.

C12. **Peter Alvaro**, Joshua Rosen, and Joseph M Hellerstein, "Lineage-driven fault injection", *Proceedings of the 2015 ACM SIGMOD International Conference on Management of Data (SIGMOD 2015)*, Melbourne, Victoria, Australia: ACM, May 2015.

C11. **Peter Alvaro**, Neil Conway, Joseph M. Hellerstein, and David Maier, "Blazes: Coordination analysis for distributed programs", *Proceedings of the 30th International Conference on Data Engineering (ICDE 2014)*, Chicago, IL: IEEE, April 2014.

C10. **Peter Alvaro**, Peter Bailis, Neil Conway, and Joseph M Hellerstein, "Consistency without borders", *Proceedings of the 4th Annual Symposium on Cloud Computing (SoCC 2013)*, Santa Clara, CA: ACM, October, 2013.

C9. Neil Conway, William R Marczak, **Peter Alvaro**, Joseph M Hellerstein, and David Maier, "Logic and lattices for distributed programming", *Proceedings of the 3rd Annual Symposium on Cloud Computing (SoCC 2012)*, San Jose, CA: ACM, October, 2012.

C8. **Peter Alvaro**, Tom J. Ameloot, Joseph M. Hellerstein, William R Marczak, and Jan Van den Bussche, "A declarative semantics for Dedalus", *Proceedings of the Second international conference on Datalog in Academia and Industry (Datalog2.0 2012)*, Vienna, Austria, September 2012.

C7. William R Marczak, **Peter Alvaro**, Neil Conway, Joseph M Hellerstein, and David Maier, "Confluence analysis for distributed programs: A model-theoretic approach", *Proceedings of the Second international conference on Datalog in Academia and Industry (Datalog2.0 2012)*, Vienna, Austria, September 2012.

C6. **Peter Alvaro**, Andrew Hutchinson, Neil Conway, William R Marczak, and Joseph M Hellerstein, "BloomUnit: Declarative testing for distributed programs", *Proceedings of the Fifth International Workshop on Testing Database Systems (DBTest 2012)*, Scottsdale, AZ: ACM, May 2012.

C5. **Peter Alvaro**, Neil Conway, Joe Hellerstein, and William R Marczak, "Consistency Analysis in Bloom: a CALM and Collected Approach", *Proceedings of the 5th Biennial Conference on Innovative Data Systems Research (CIDR 2011)*, Asilomar, CA, January, 2011.

C4. Haryadi S Gunawi, Thanh Do, Pallavi Joshi, **Peter Alvaro**, Joseph M Hellerstein, Andrea C Arpaci-Dusseau, Remzi H Arpaci-Dusseau, Koushik Sen, and Dhruba Borthakur, "FATE and DESTINI: a framework for cloud

recovery testing", *Proceedings of the 8th USENIX Symposium on Networked Systems Design and Implementation (NSDI 2011)*, Boston, MA: USENIX, April 2011.

C3. **Peter Alvaro**, Tyson Condie, Neil Conway, Khaled Elmeleegy, Joseph M Hellerstein, and Russell Sears, "Boom analytics: exploring data-centric, declarative programming for the cloud", *Proceedings of the 5th European conference on Computer systems (Eurosys 2010)*,

C2. Tyson Condie, Neil Conway, **Peter Alvaro**, Joseph M Hellerstein, Khaled Elmeleegy, and Russell Sears, "MapReduce online", *Proceedings of the 7th USENIX Symposium on Networked Systems Design and Implementation (NSDI 2010)*, San Jose, CA: USENIX, April 2010.

C1. **Peter Alvaro**, William R Marczak, Neil Conway, Joseph M Hellerstein, David Maier, and Russell Sears, "Dedalus: Datalog in time and space", *Proceedings of the First international Conference on Datalog Reloaded (Datalog 2010)*, Oxford, England, September 2010.

Technical Reports

C1. Noah Watkins, Michael Sevilla, Ivo Jimenez, Neha Ojha, **Peter Alvaro**, Carlos Maltzahn, "Brados: Declarative, Programmable Object Storage", Technical Report UCSC-SOE-16-12, December 2016.

Invited Papers

C1. **Peter Alvaro** "OK, but why? Tracing and debugging distributed systems", *Research for Practice, ACM Queue*, January 2017.

SOFTWARE

SW2. `LDFI`: Lineage-driven fault injection simulator.

SW1. `BUD`: The Bloom disorderly programming language, implemented as a ruby DSL.

PROFESSIONAL ACTIVITIES

Conference Organization

2018 **Program Committee:** ACM SIGMOD 2018

2017 **Program Committee:** ACM SIGMOD 2017
ACM SoCC 2018
O'Reilly Velocity 2017
DBPL 2017
FADS 2017

2016 **Program co-Chair:** Workshop on Principles and Practice of Consistency for Distributed Data (PaPoC) 2016.
Program Committee: ACM SIGMOD 2016
PVLDB 2016
PMLDC 2016
Travel Award Selection Committee co-Chair: ACM SIGMOD 2016

2015 **Program Committee:** PaPoC 2015

Membership in Professional Associations

2015 Member, Association for Computing Machinery.

2016 Member, USENIX.

Talks

2017 **Keynote:** "Orchestrated Chaos (with a prelude of myths and an appendix of dreams)", O'Reilly Velocity, San Jose, CA, June 2017.

2017 "Does your fault-tolerant data management system tolerate faults?" Norcal DB Day, San Francisco, CA, April 2017.

2017 "Orchestrating Chaos", Erlang Factory, San Francisco, CA, March 2017.

2017 "Orchestrating Chaos", Facebook Developer Infrastructure Tech Talk Series, Menlo Park, CA, March 2017.

2017 "GeneralStore: Declarative Programmable Storage", CIDR 2017, Santa Cruz, CA, January 2017.

2016 **Keynote:** "Orchestrated Chaos", Reactive Summit 2016.

2016 **Keynote:** "Monkeys in Lab Coats: Applying Failure Testing Research @Netflix", QCon London 2016.

2016 "'Cause, that's why", Papers We Love, San Francisco, CA, December 2016.

2016 "Applying Database Research in the Wild", Stanford University DAWN Seminar, Stanford, CA, November 2016.

2016 "Applying Database Research in the Wild", UC Berkeley Database Seminar, Berkeley, CA, November 2016.

2016 "Applying Failure Testing Research @Netflix", QCon San Francisco, San Francisco, CA, November 2016.

2016 "Orchestrated Chaos", Chaos Community Day, Amazon, Seattle, WA, August 2016.

2016 "Lineage-driven Fault Injection", VMWare Research Group Chat, VMWare, Palo Alto, CA, August 2016.

2016 "Databases are dead: long live databases!", Norcal DB Day, Google, Inc. Mountain View, CA May, 2016.

2015 **Keynote:** "I see what you mean", Strange Loop 2015, Saint Louis, MO, September, 2015.
"Lineage-driven fault injection", ACM SIGMOD 2015, Melbourne, Victoria, Australia, June, 2015.
"Lineage-driven fault injection", Pivotal, Palo Alto, CA, November, 2015.
"Lineage-driven fault injection", Arista Networks, San Francisco, CA, November, 2015.

2014 **Keynote:** "Outwards from the middle of the maze", RICON 2014, Las Vegas, NV.
"Blazes: coordination analysis for distributed programs", ICDE 2014, Chicago, IL, April, 2014.
"Ineluctable modality of the distributed", Papers We Love SF, San Francisco, CA, August, 2014.

2013 "Consistency without borders", ACM SoCC 2013, Santa Clara, CA, October, 2013.
"Bloom and CALM: Programming the Cloud", Norcal DB Day 2013, Stanford, CA, April, 2013.
"Disorderly Distributed Programming with Dedalus and Bloom", UCLA Programming Language Seminar, March, 2013.
Panelist, *Think Distributed* Panel, Ricon 2012, San Francisco, CA, December, 2013.

2012 "BloomUnit: Declarative testing for distributed programs", ACM DBTest 2012, Scottsdale, AZ, May 2012.
"Bloom: disorderly programming for a distributed world", lang.next, Microsoft, Inc., Redmond, WA, April, 2012.

2011 "Bloom: disorderly programming. CALM analysis", Ask.com, Oakland, CA, March, 2011.
"Bloom: CALMly building skyscrapers on quicksand", Twitter, Inc., San Francisco, CA, January 2011.

2010 "Show and Tell: Building a consistent, replicated shopping cart in bloom", TDS Research Group, MIT, Cambridge, MA, November 2010.
"I Do Declare: Consensus in a Logic Language", OSQ Retreat, Santa Cruz, CA, May 2010.

2009 "I Do Declare", NetDB 2009, Big Sky, MT, October 2009.
"BOOM: Data-Centric Programming For The Data Center", Infolunch, Stanford University, Stanford, CA, April 2009.

UNIVERSITY SERVICE

Departmental and School Service

2017	Curriculum development: *Computer Systems Fundamentals*
2016–17	Computer Science Dept. Faculty Search Committee.
2015–16	Computer Science Dept. Graduate Admission Committee.

MENTORING AND STUDENT ADVISING

Doctoral Students

Dates	Relationship	Degree Year	Name and Activities
2015 Fall - Present	Primary Supervisor		Kamala Ramasubramanian
2016 Fall - Present	Primary Supervisor		Tuan Tran
2016 Fall - Present	Primary Supervisor		Kathryn Dahlgren
2016 Fall	Other Advisor	2016	Richard Halpert **Member:** Dissertation Committee
2016 Fall	Other Advisor	2016	Kun Qian **Member:** Dissertation Committee
2016 Spring	Other Advisor	2016	Dustin Rhodes **Member:** Qualifying Examination Committee
2016 Spring	Other Advisor	2016	Christine Strong **Member:** Dissertation Committee

Masters Students

Dates	Relationship	Degree Year	Name and Activities
2016 Fall - Present	Primary Supervisor		Ashutosh Raina
2017 Winter	Other Advisor		Neha Ojha **Member:** Masters Project Committee
2017 Winter	Other Advisor		Greeshma Swaminathan **Member:** Masters Project Committee
2016 Fall	Masters Project Supervisor		Sanjana Maiya **Chair:** Masters Project Committee
2017 Winter	Other Advisor		Trivikram Bollempalli **Member:** Masters Project Committee
2016 Fall	Other Advisor		Abishek Grover **Member:** Masters Thesis Committee
2016 Spring	Other Advisor		Kathryn Dahlgren **Member:** Masters Thesis Committee

Undergraduate Students

Dates	Relationship	Degree Year	Name and Activities
2017 Winter-present	Primary Supervisor		Asha Karim

COURSES TAUGHT

Courses in bold italics are those for which I either developed or significantly revised the curriculum.

Undergraduate

Winter 2017 CMPS 128: Distributed Systems
Spring 2016 ***CMPS 128: Distributed Systems***
Spring 2013 CS 194-017: Programming the Cloud (UC Berkeley)
Spring 2011 ***CS 194-017: Programming the Cloud*** (UC Berkeley)

Graduate

Fall 2016 ***CMPS 232: Graduate Distributed Systems***
Winter 2015 ***CMPS 290S: Advanced Topics in Computer Systems: Distributed Storage Systems and Programming Models***