James Bornholt

Contact

Computer Science and Engineering
Box 352350
Seattle, WA 98195-2350

bornholt@uw.edu
https://homes.cs.washington.edu/~bornholt/

Education

University of Washington — Seattle, WA, USA
PhD in Computer Science and Engineering — September 2014 – present
Masters of Computer Science and Engineering — March 2016

- Advisors: Emina Torlak, Dan Grossman, Luis Ceze
- Member of the programming languages and computer architecture groups

Australian National University — Canberra, Australia
Bachelor of Philosophy with First Class Honours and the University Medal — January 2010 – December 2013

- Majors in Computer Science and Mathematics
- Thesis: *Abstractions and Techniques for Programming with Uncertain Data*, advised by Steve Blackburn

Experience

Microsoft Research — Canberra, Australia
Software Engineer — January 2014 – September 2014

Microsoft Research — Redmond, WA, USA
Research Intern, Research in Software Engineering (RiSE) group — November 2012 – February 2013

Microsoft Research — Redmond, WA, USA
Research Intern, Research in Software Engineering (RiSE) group — November 2011 – February 2012

Publications

Conference and Journal Papers

Push-Button Verification of File Systems via Crash Refinement.
H. Sigurbjarnarson, J. Bornholt, E. Torlak, and X. Wang.
OSDI 2016.

Disciplined Inconsistency with Consistency Types.
B. Holt, J. Bornholt, I. Zhang, D. R. K. Ports, M. Oskin, and L. Ceze.
SoCC 2016.

Specifying and Checking File System Crash-Consistency Models.
J. Bornholt, A. Kaufmann, J. Li, A. Krishnamurthy, E. Torlak, and X. Wang.
ASPLOS 2016.

A DNA-Based Archival Storage System.
J. Bornholt, R. Lopez, D. M. Carmean, L. Ceze, G. Seelig, and K. Strauss.
ASPLOS 2016.

Optimizing Synthesis with Metasketches.
J. Bornholt, E. Torlak, D. Grossman, and L. Ceze.
POPL 2016.

Uncertain⟨T⟩: Abstractions for Uncertain Hardware and Software.
J. Bornholt, T. Mytkowicz, and K. S. McKinley.
IEEE Micro, vol. 35, no. 3, pp. 132–143, May–June 2015.

Hardware–Software Co-Design: Not Just a Cliché.
A. Sampson, J. Bornholt, and L. Ceze.
SNAPL 2015.

Uncertain⟨T⟩: A First-Order Type for Uncertain Data.
J. Bornholt, T. Mytkowicz, and K. S. McKinley.
ASPLOS 2014.
ACM SIGPLAN Research Highlight, November 2014.
IEEE Micro's Top Picks from the Computer Architecture Conferences, 2015.

Workshop Papers

Scaling Program Synthesis by Exploiting Existing Code.
J. Bornholt and E. Torlak. ML4PL 2015 (colocated with ECOOP 2015).

Approximate Program Synthesis.
J. Bornholt, E. Torlak, L. Ceze, and D. Grossman.
WAX 2015 (colocated with PLDI 2015).

REACT: A Framework for Rapid Exploration of Approximate Computing Techniques.
M. Wyse, A. Baixo, T. Moreau, B. Zorn, J. Bornholt, A. Sampson, L. Ceze, and M. Oskin.
WAX 2015 (colocated with PLDI 2015).

Programming the Internet of Uncertain ⟨T⟩hings.
J. Bornholt, N. Meng, T. Mytkowicz, and K. S. McKinley.
SCAW 2015 (colocated with HPCA 2015).

There's Something About Bayes: Effective Probabilistic Programming for the Rest of Us.
J. Bornholt, T. Mytkowicz, and K. S. McKinley.
APPROX 2014 (colocated with PLDI 2014).

Posters

Uncertain⟨T⟩: A First-Order Type for Uncertain Data.
J. Bornholt.
PLDI 2013.
Winner, PLDI Student Research Competition, 2013.
Second Place, ACM Student Research Competition Grand Final, 2014.

The Model Is Not Enough: Understanding Energy Consumption in Mobile Devices.
J. Bornholt, T. Mytkowicz, and K. S. McKinley.
Hot Chips 24, 2012.

Presentations and Seminars

Programming with Estimates
Programming Languages Mentoring Workshop at PLDI 2016, Invited Talk

Optimizing Synthesis with Metasketches (for Automated Approximate Programming)
Dagstuhl Seminar 15491 (Approximate and Probabilistic Computing), Invited Talk

Teaching

Teaching Assistant, University of Washington
- CSE 507 (graduate Computer-Aided Reasoning for Software), Spring 2016

Tutor, University of Washington
- CSE 341 (undergraduate Programming Languages), 2015

Guest Lectures

Practical Applications of SAT — Spring 2016
CSE 507 (graduate Computer-Aided Reasoning for Software), University of Washington

Memory Consistency Models — Autumn 2015
CSE 451 (undergraduate Operating Systems), University of Washington

Program Verification — Autumn 2015
COMP 1140 (undergraduate honors intro CS), Australian National University

Service

Students Advised
- Emily McAlister, B. Software Eng., ANU, 2014 (co-advised with Steve Blackburn and Kathryn McKinley)
  Thesis: *The Relationship Between Software and Hardware Energy Consumption on Android Mobile Devices*

Committee Membership
- POPL Artifact Evaluation Committee, 2016
- PLDI Artifact Evaluation Committee, 2015

External Reviews

- CAV 2015
- ACM Transactions on Embedded Computing (TECS) 2015
- ASPLOS 2015

Awards

- IEEE Micro Top Picks from the Computer Architecture Conferences, for Uncertain$\langle T \rangle$, 2015
- ACM SIGPLAN Research Highlight, for Uncertain$\langle T \rangle$, 2014
- David Notkin Endowed Graduate Fellowship, University of Washington, 2014–2015
- Second Place, ACM Student Research Competition Grand Finals (undergraduate category), 2014
- ANU University Medal for Computer Science, 2013
- Winner, ACM PLDI Student Research Competition (undergraduate category), 2013
- ANU Erin Brent Computer Science Prize, 2013
- ANU College of Engineering and Computer Science Dean's Prize, 2013
- ANU Boyapati Computer Science and Mathematics Prize, 2010, 2011 and 2012