

# James Bornholt

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<b>Contact</b>	Computer Science and Engineering Box 352350 Seattle, WA 98195-2350	bornholt@uw.edu <a href="https://homes.cs.washington.edu/~bornholt/">https://homes.cs.washington.edu/~bornholt/</a>
<b>Education</b>	<b>University of Washington</b> <i>PhD in Computer Science and Engineering</i> <i>Masters of Computer Science and Engineering</i> <ul style="list-style-type: none"><li>• Advisors: Emina Torlak, Dan Grossman, Luis Ceze</li><li>• Member of the <a href="#">programming languages</a> and <a href="#">computer architecture</a> groups</li></ul> <b>Australian National University</b> <i>Bachelor of Philosophy with First Class Honours and the University Medal</i> <ul style="list-style-type: none"><li>• Majors in Computer Science and Mathematics</li><li>• Thesis: <i>Abstractions and Techniques for Programming with Uncertain Data</i>, advised by Steve Blackburn</li></ul>	Seattle, WA, USA September 2014 – present March 2016  Canberra, Australia January 2010 – December 2013
<b>Experience</b>	<b>Microsoft Research</b> <i>Software Engineer</i>  <b>Microsoft Research</b> <i>Research Intern, Research in Software Engineering (RiSE) group</i>  <b>Microsoft Research</b> <i>Research Intern, Research in Software Engineering (RiSE) group</i>	Canberra, Australia January 2014 – September 2014  Redmond, WA, USA November 2012 – February 2013  Redmond, WA, USA November 2011 – February 2012
<b>Publications</b>	<b>Conference and Journal Papers</b>  <i>Push-Button Verification of File Systems via Crash Refinement.</i> H. Sigurbjarnarson, J. Bornholt, E. Torlak, and X. Wang. OSDI 2016.  <i>Disciplined Inconsistency with Consistency Types.</i> B. Holt, J. Bornholt, I. Zhang, D. R. K. Ports, M. Oskin, and L. Ceze. SoCC 2016.  <i><a href="#">Specifying and Checking File System Crash-Consistency Models.</a></i> J. Bornholt, A. Kaufmann, J. Li, A. Krishnamurthy, E. Torlak, and X. Wang. ASPLOS 2016.  <i><a href="#">A DNA-Based Archival Storage System.</a></i> J. Bornholt, R. Lopez, D. M. Carmean, L. Ceze, G. Seelig, and K. Strauss. ASPLOS 2016.  <i><a href="#">Optimizing Synthesis with Metasketches.</a></i> J. Bornholt, E. Torlak, D. Grossman, and L. Ceze. POPL 2016.  <i><a href="#">Uncertain⟨T⟩: Abstractions for Uncertain Hardware and Software.</a></i> J. Bornholt, T. Mytkowicz, and K. S. McKinley. IEEE Micro, vol. 35, no. 3, pp. 132–143, May–June 2015.  <i><a href="#">Hardware-Software Co-Design: Not Just a Cliché.</a></i> A. Sampson, J. Bornholt, and L. Ceze. SNAPL 2015.  <i><a href="#">Uncertain⟨T⟩: A First-Order Type for Uncertain Data.</a></i> 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  $\langle T \rangle$ 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 $\langle T \rangle$ : 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*

CSE 507 (graduate Computer-Aided Reasoning for Software), University of Washington

Spring 2016

*Memory Consistency Models*

CSE 451 (undergraduate Operating Systems), University of Washington

Autumn 2015

*Program Verification*

COMP 1140 (undergraduate honors intro CS), Australian National University

Autumn 2015

## Service

### Committee Membership

- PLDI 2017 External Review Committee
- POPL 2016 Artifact Evaluation Committee
- PLDI 2015 Artifact Evaluation Committee

### External Reviews

- CAV 2015

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

#### **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*

#### **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