

MARTIN MAAS

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Research Interests: Managed Language Runtime Systems, Computer Architecture, Operating Systems, Programming Languages, Warehouse-Scale Computers, Rack-Scale Computing, Cloud Computing, Security

EDUCATION

PhD, Computer Science (expected May 2017)

University of California at Berkeley

Advisors: Krste Asanović, John Kubiawicz

Master of Science, Computer Science (August 2011 to May 2014)

University of California at Berkeley

GPA: 3.96/4.0, Thesis: “PHANTOM: Practical Oblivious Computation in a Secure Processor”

Bachelor of Arts, Computer Science with Mathematics (October 2008 to June 2011)

University of Cambridge, Queens’ College

Part IA: Class I (*ranked 2nd in university class*), Part IB: Class I (*ranked 1st*), Part II: Class I (*ranked 1st*)

Part II Dissertation: “A JVM for the Barrelfish Operating System”

Microsoft Research Prize for the Best Individual Project (Part II Dissertation)

HONORS & AWARDS

- Outstanding Graduate Student Instructor Award, 2016
- ASPLOS Best Paper Award, 2015
- Microsoft Research Prize for the Best Individual Project, 2011
- Undergraduate Awards at Cambridge: Red Gate Prize (2011), Joshua King Prize (2011), Queens’ College Foundation Scholarship (2010), East Anglia Branch Prize of the BCS (2010), Hughes Prize (2010), ECM Prize for the Best Student (2010), Venn Prize (2009), Queens’ College Exhibition (2009)
- German National Academic Foundation (*Studienstiftung des deutschen Volkes*) Scholarship, 2008-2014
- Intel International Science and Engineering Fair: 3rd prize of the ACM, 3rd prize of the IEEE Computer Society, 2008
- National Winner of *Jugend Forscht* (Germany’s largest science competition, 10,000+ participants per year), 2007
- Konrad Zuse Youth Award for Computer Science of the Eduard Rhein Foundation, 2007
- German National Team at the International Olympiad in Informatics (IOI) and European Contests (Gold Medal at the Baltic Olympiad in Informatics 2007, Silver Medal at the Central European Olympiad in Informatics 2007, Bronze Medal at the Baltic Olympiad in Informatics 2006)
- National Winner of the German National Computer Science Competition (2,000+ participants per year), 2008

PUBLICATIONS

Conference Publications:

“Taurus: A Holistic Language Runtime System for Coordinating Distributed Managed-Language Applications”

Martin Maas, Krste Asanović, Tim Harris, John Kubiawicz

International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS ’16**)

“GhostRider: A Hardware-Software System for Memory Trace Oblivious Computation”

Chang Liu, Austin Harris, Martin Maas, Michael Hicks, Mohit Tiwari, Elaine Shi

International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS ’15**)

Winner of the Best Paper Award

“Callisto: Co-Scheduling Parallel Runtime Systems”

Tim Harris, Martin Maas, Virendra Marathe

ACM European Conference on Computer Systems (**EuroSys '14**)

“PHANTOM: Practical Oblivious Computation in a Secure Processor”

Martin Maas, Eric Love, Emil Stefanov, Mohit Tiwari, Elaine Shi, Krste Asanović, John Kubiatoiwicz, Dawn Song

ACM Conference on Computer and Communications Security (**CCS '13**)

Finalist for NYU-Poly (formerly AT&T) Best Applied Security Paper Award 2013

“GPUs as an Opportunity for Offloading Garbage Collection”

Martin Maas, Philip Reames, Jeffrey Morlan, Krste Asanović, Anthony D. Joseph, John Kubiatoiwicz

International Symposium on Memory Management (**ISMM '12**)

Workshop Publications:

“Grail Quest: A New Proposal for Hardware-assisted Garbage Collection”

Martin Maas, Krste Asanović, John Kubiatoiwicz

6th Workshop on Architectures and Systems for Big Data (**ASBD '16**)

“Trash Day: Coordinating Garbage Collection in Distributed Systems”

Martin Maas, Tim Harris, Krste Asanović, John Kubiatoiwicz

15th Workshop on Hot Topics in Operating Systems (**HotOS '15**)

“The Case for the Holistic Language Runtime System”

Martin Maas, Krste Asanović, Tim Harris, John Kubiatoiwicz

International Workshop on Rack-scale Computing (**WRSC '14**)

“A High-Performance Oblivious RAM Controller on the Convey HC-2ex Heterogeneous Computing Platform”

Martin Maas, Eric Love, Emil Stefanov, Mohit Tiwari, Elaine Shi, Krste Asanović, John Kubiatoiwicz, Dawn Song

Workshop on the Intersections of Computer Architecture and Reconfigurable Logic (**CARL '13**)

“A JVM for the Barrelfish Operating System”

Martin Maas, Ross McIlroy

Workshop on Systems for Future Multi-core Architectures (**SFMA '12**)

Journal:

“Stegacrypt - A modular Steganography Framework”

Martin Maas

Junge Wissenschaft (Young Scientist), Issue 82, 2009

“Kryptographie” (in German)

Martin Maas

Naturwissenschaftliche Rundschau, Issue 718, 2008

“Stegacrypt - eine modulare Steganographie-Software” (in German)

Martin Maas

Naturwissenschaftliche Rundschau, Issue 718, 2008

Theses:

“PHANTOM: Practical Oblivious Computation in a Secure Processor”, MS Thesis, UC Berkeley, May 2014

“A JVM for the Barrelfish Operating System”, Part II Dissertation, University of Cambridge, May 2011

Technical Reports:

“The Rocket Chip Generator”

Krste Asanović, Rimas Avizienis, Jonathan Bachrach, Scott Beamer, David Biancolin, Christopher Celio, Henry Cook, Palmer Dabbelt, John Hauser, Adam Izraelevitz, Sagar Karandikar, Benjamin Keller, Donggyu Kim, John Koenig, Yunsup Lee, Eric Love, Martin Maas, Albert Magyar, Howard Mao, Miquel Moreto, Albert Ou, David Patterson, Brian Richards, Colin Schmidt, Stephen Twigg, Huy Vo, Andrew Waterman

UCB/EECS-2016-17, EECS Department, University of California, Berkeley, April 2016

TALKS

“A Java Virtual Machine for RISC-V: Porting the Jikes Research VM”

- at 5th RISC-V Workshop, Mountain View, CA, September 30, 2016

“FireBox: Designing the Warehouse-Scale Computer of 2020” (**Invited Keynote**)

- at 1st Workshop on Hot Topics in Data Centers (HotDC), Beijing, China, September 27, 2016

“Hardware and Software Support for Managed-Language Workloads in Data Centers”

- at Microsoft Research, Redmond, WA, August 31, 2016
- at Samsung Research America, Mountain View, CA, August 17, 2016
- at EPFL, Lausanne, Switzerland, December 1, 2015

“Offloading Garbage Collection to GPUs and Custom Hardware”

- at AMD Research, Bellevue, WA, August 30, 2016

“Grail Quest: A New Proposal for Hardware-Assisted Garbage Collection”

- at ASBD (ISCA Workshop), Seoul, Korea, June 19, 2016

“Taurus: A Holistic Language Runtime System for Coordinating Distributed Managed-Language Applications”

- at ASPLOS, Atlanta, GA, April 5, 2016

“Designing the 2020 Warehouse-Scale Computer from the Ground Up”

- at Dagstuhl Seminar on Rack-Scale Computing, Schloss Dagstuhl, Germany, October 13, 2015

“Trash Day: Coordinating Garbage Collection in Distributed Systems”

- at Oracle Labs, Redwood Shores, CA, Wednesday, September 17, 2016
- at HotOS, Kartause Ittingen, Switzerland, May 18, 2015

“Ideas for the FireBox Software Stack”

- at Microsoft Research, Cambridge, UK, July 25, 2014
- at University of Cambridge, Cambridge, UK, August 12, 2014

“The Case for the Holistic Language Runtime System”

- at WRSC (EuroSys Workshop), Amsterdam, Netherlands, April 13, 2014

“Callisto: Co-scheduling Parallel Runtime Systems”

- at University of Cambridge, Cambridge, UK, November 21, 2013
- at EuroSys 2014, Amsterdam, Netherlands, April 16, 2014

“PHANTOM: A Parallel Architecture for Practical Oblivious Computation”

- at University of Cambridge, Cambridge, UK, June 11, 2013
- at Microsoft Research, Redmond, WA, May 10, 2013
- at CCS, Berlin, Germany, November 5, 2013
- at CARL (MICRO Workshop), Davis, CA, December 7, 2013

“GPUs as an Opportunity for Offloading Garbage Collection”

- at ISMM, Beijing, China, June 15, 2012

“A JVM for the Barrelfish Operating System”

- at University of Cambridge, Cambridge, UK, April 5, 2012
- at SFMA (EuroSys Workshop), Bern, Switzerland, April 10, 2012

INDUSTRY EXPERIENCE

- Research Assistant (Internship)
Oracle Labs, Cambridge (2014)
8-week internship. Worked with Tim Harris on coordinating garbage collection in a rack-scale system.
- Research Assistant (Internship)
Oracle Labs, Cambridge (2013)
12-week internship. Worked with Tim Harris on co-scheduling parallel runtime systems on NUMA machines.
- Software Engineering Intern
Google, New York (2010)
12-week internship. Worked on an intern project concerned with scanning through events at scale in order to detect and characterize certain classes of errors, as well as aggregating and presenting these errors.

TEACHING EXPERIENCE

- Graduate Student Instructor (GSI) at UC Berkeley (teaching assistant)
 - CS152: “Computer Architecture and Engineering” (Fall 2016)
 - CS61C: “Machine Structures” (Spring 2015)
- Discipline-Cluster Workshop Leader at bi-annual GSI Conference, training new UC Berkeley GSIs (Fall 2016)
- Demonstrator for the Part IB course “Further Java” at the University of Cambridge (2010)
- Coaching the German IOI Team (Deputy Team Leader at BOI 2008, Poland and CEOI 2009, Romania)
- Teaching a course on software engineering and game development for 10th grade students (2006)

SERVICE

- Artifact Evaluation Committee for PPOPP 2015
- Artifact Evaluation Committee for CGO 2015

REFERENCES

- **Krste Asanović** (Full Professor, UC Berkeley, Advisor)
E-Mail: krste@eecs.berkeley.edu
- **John Kubiawicz** (Full Professor, UC Berkeley, Advisor)
E-Mail: kubitron@eecs.berkeley.edu
- **Tim Harris** (Architect, Oracle Labs, Internship Advisor)
E-Mail: timothy.l.harris@oracle.com
- **Mohit Tiwari** (Assistant Professor, UT Austin, Collaborator)
E-Mail: tiwari@austin.utexas.edu