

MARTIN MAAS

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Nationality: German

EDUCATION

- 2011 - present **University of California, Berkeley** (*MS/PhD Computer Science*)
Research Advisors: Krste Asanović and John Kubiatoiwicz
- 2014 **Master of Science** in Computer Science (GPA: 3.96/4.0)
- 2008 - 2011 **University of Cambridge, Queens' College** (*B.A. Computer Science with Mathematics*)
- 2009 Part IA: **Class I** (2nd place in the university class, out of ~ 75 students)
- 2010 Part IB: **Class I (1st place)** in the university class, out of ~ 75 students)
- 2011 Part II: **Class I (1st place)** in the university class, jointly **best dissertation**)
- 1998 - 2007 Georg Cantor Gymnasium Halle (High School)
- 2007 **Abitur 1.0** (834/840 points, among the top scores in the state)
Majors: Computer Science, Mathematics, English, German

WORK AND RESEARCH EXPERIENCE

- 2011 - present **University of California, Berkeley** *Graduate Student Researcher*
- Research on managed languages, hardware support for garbage collection, secure systems.
- 2013, 2014 **Oracle Labs** *Research Assistant/Intern*
- Two 12/8 week research internships supervised by Tim Harris at Oracle Labs, Cambridge (UK).
 - Worked on reducing interference in parallel workloads, and GC for distributed Java workloads.
- 2010 **Google Inc.** *Software Engineering Intern*
- 12 week software engineering summer internship at the Google New York City Office.
 - 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.
- 2007 - 2010 **Miaplaza Inc.** *Software Engineer/Consultant*
- California-based web company (started as a social network, now an education platform).
 - Part-time work from Germany, worked in different areas (UI, backend, test automation, analytics) of a medium-sized project (100,000+ lines of code), both specifying and implementing new features.
- 2008 - 2010 **Freelance Software Development** *Software Engineer/Consultant*
- Web projects for different clients (software development, consulting).
- 2008 - 2011 **Europe & Me (Volunteer Work)** *Editor/Administrator*
- Free transnational online lifestyle magazine covering topics such as politics, culture and careers.
 - Founding member of the magazine, initially worked as web developer, since 2009 as editor.
 - Won the Charlemagne Youth Prize of the European Parliament (2011).
- 2007 - 2008 **Compulsory Civilian Service (Replacement for German Military Service)** *Community Service*
- Completed civilian service at *Evangelische Studentengemeinde Halle* ("Protestant Student Parish")
 - Developed a CMS for the student parish's website in PHP (has since been reused in other projects).

OTHER PROJECTS AND ACTIVITIES

- 2015-2017 Porting the **JikesRVM** Research Java Virtual Machine to the RISC-V instruction set
- 2014-2017 Porting **Yocto/OpenEmbedded** to RISC-V and maintaining the port (**riscv-poky**)
- 2010-2011 Final Year Project: **A JVM for the Barrelfish OS** (supervised by Ross McIlroy, Tim Harris from MSR)
- Implemented a distributed JVM, evaluated the performance impact of design decisions.
- 2010 Working on an **inertial navigation system** (group project at the University of Cambridge)
- 2009 Summer seminar (2 weeks) on security, prepared a seminar talk on *Automotive Security Engineering*
- 2005 - 2008 Developing *Stegacrypt*, a **Modular Steganography Framework**
- Project for *Jugend forscht*, Germany's largest science competition (also presented at *ISEF* 2008)
- 2002 - 2007 Participation in **various summer schools** in Mathematics, Computer Science, Software Engineering, etc.
- 2005 - 2006 Development of a **set of programs for physics simulations** (state winner at *Jugend forscht*)
- 2004 - 2005 Development of a software to create **electronic surveys** (for the University of Ulm)
- 2004 - 2005 Development of an **e-learning platform** on Nuclear Physics (regional winner at *Jugend forscht*)
- 2004 - 2005 Working on a Scanning Tunneling Microscope (at the Physics Department of the University of Halle)
- 2004 Internship at *Arbor IT Systems*, developed a system to archive data sheets (2 weeks)
- 2001, 2006 Creating two companion CDs for *Klett Verlag*, one of Germany's largest publishers of teaching material

TEACHING EXPERIENCE

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

AWARDS AND ACHIEVEMENTS

- 2016 Outstanding Graduate Student Instructor Award (for teaching CS61C in Spring 2015)
- 2015 **ASPLOS’15 Best Paper Award** (with C. Liu, A. Harris, M. Hicks, M. Tiwari, E. Shi)
- 2011 **Microsoft Research Prize** for the Best Individual Project (jointly)
- 2011 Red Gate Prize for the Best Student (for the top marks in the 2011 Tripos exams)
- 2011 **Joshua King Prize** (given by Queens’ College for outstanding distinction in the third year)
- 2010 East Anglia Branch Prize of the British Computer Society (for the top marks in the 2010 Tripos exams)
- 2010 **Hughes Prize** (given by Queens’ College for outstanding distinction in the second year)
- 2010 ECM Prize for the **Best Student** (for the top marks in the 2010 Tripos exams)
- 2009 **Venn Prize** (given by Queens’ College for outstanding distinction in the first year)
- 2004 - 2008 **BWINF (German National Computer Science Competition)**
- Largest computer science competition in Germany (1,000+ participants per year), competition consists of 3 rounds, tasks are research-related (involving scientific writing and discussions with researchers).
 - Finalist (i.e. top 24) for 4 consecutive years (2005-2008), Award for Best Teamwork (2005), 2nd Place Award (2006), **National Winner** (2008), **Award for the Top Performance** (2008)
- 2008 **Intel International Science and Engineering Fair**
- One of two competitors from Germany (qualified through Jugend forscht finals)
 - **3rd Prize of the ACM, 3rd Prize of the IEEE Computer Society**
- 2007 **Konrad Zuse Youth Award for Computer Science** of the Eduard Rhein Foundation
- 2006-2007 **Jugend forscht** (Youth researches)
- Germany’s largest and most reputable youth research competition (10,000+ participants per year)
 - **National Winner (1st Place)** in Mathematics/Computer Science (2007), Finalist (state winner) for 2 years (qualified but absent at the finals in 2006), Regional Winner with 3 projects, 5 Special Awards
- 2006-2007 **International Olympiad in Informatics (IOI)** and related competitions
- On the **German National Team** in 2006 & 2007, **Bronze Medal** (BOI 2006, Finland), **Gold Medal** (BOI 2007, Germany), **Silver Medal** (CEOI 2007, Czech Republic), member of the German national team at IOI 2007, Croatia
- 2007 Honored by the **German Secretary of Science and Education** for outstanding distinction, as one of 8 students in Germany at *Tag der Talente 2007* (national event to highlight achievements by students)
- 2007 eLeMeNTe Award (given to one high school graduate from Saxony-Anhalt each year)
- 2006 **German National Mathematics Competition** (Finalist, i.e. top 50 out of 2,000+ competitors)
- 2006 Honored by the State Secretary of Education for outstanding distinction
- 2005 Cantor Award (given to one student per year by my school for academic and social achievements)

SCHOLARSHIPS

- 2010 - 2011 Foundation Scholarship at Queens’ College, Cambridge (for distinction in the second-year exams)
- 2009 - 2011 College Exhibition at Queens’ College, Cambridge (for distinction in the first-year exams)
- 2008 - 2011 **Cambridge European Trust** (program sponsoring European students at Cambridge University)
- 2007 - present **German National Academic Foundation** (sponsoring students of outstanding academic achievements)
- 2008 - present E-Fellows (online scholarship program and careers network)
- 2006 - 2007 E-Juniors (online scholarship program for high school students)

RELEVANT SKILLS

- Programming Languages: **C/C++**, **Java**, **Python**, JavaScript, Scala, C#, Verilog, Chisel
- Domain Expertise: JVMs (Jikes RVM), RISC-V (Software Stack, RocketChip SoC Generator), Memory Management (MMTk), Operating Systems, Computer Architecture, Yocto/OpenEmbedded, GPU Programming (OpenCL)
- Past experience in web development (HTML, CSS, JavaScript, jQuery, Prototype, Bootstrap)

MEMBERSHIPS

ACM Student Member, BCS Student Member, German National Computer Science Competition Alumni, Tönissteiner High School Student Group (Alumni), Europe of new Ideas, eLeMeNTe e.V.

CONFERENCE PUBLICATIONS

- 2016 **Taurus: A Holistic Runtime System for Coordinating Distributed Managed-Language Applications**
Martin Maas, Krste Asanović, Tim Harris, John Kubiatoiwicz
International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '16), Atlanta, GA, April 2016.
- 2015 **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), Istanbul, Turkey, March 2015.
Best Paper Award at ASPLOS 2015
- 2014 **Callisto: Co-Scheduling Parallel Runtime Systems**
Tim Harris, Martin Maas, Virendra Marathe
ACM European Conference on Computer Systems (EuroSys '14), Amsterdam, Netherlands, April 2014.
- 2013 **PHANTOM: Practical Oblivious Computation in a Secure Processor**
Martin Maas, Eric Love, Emil Stefanov, Mohit Tiwari, Elaine Shi, Krste Asanović, John Kubiatoiwicz, Dawn Song
Conference on Computer and Communications Security (CCS '13), Berlin, Germany, November 2013.
Finalist for NYU-Poly (formerly AT&T) Best Applied Security Paper Award 2013
- 2012 **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), Beijing, China, June 2012.

WORKSHOP PUBLICATIONS

- 2017 **Return of the Runtimes: Rethinking the Language Runtime System for the Cloud 3.0 Era** (*to appear*)
Martin Maas, Krste Asanović, John Kubiatoiwicz
16th Workshop on Hot Topics in Operating Systems (**HotOS '17**)
- 2016 **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), Seoul, Korea, June 2016.
- 2015 **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), Kartause Ittingen, Switzerland, May 2015.
- 2014 **The Case for the Holistic Language Runtime System**
Martin Maas, Krste Asanović, Tim Harris, John Kubiatoiwicz
International Workshop on Rack-scale Computing (WRSC '14), Amsterdam, Netherlands, April 2014.
- 2013 **A High-Performance ORAM 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), Davis, CA, December 2013.
- 2012 **A JVM for the Barrelfish Operating System**
Martin Maas, Ross McIlroy
Workshop on Systems for Future Multi-core Architectures (SFMA '12), Bern, Switzerland, April 2012.

JOURNAL PUBLICATIONS

- 2009 **Stegacrypt - A modular Steganography Framework**
Martin Maas
Junge Wissenschaft (Young Scientist), Issue 82.
- 2008 **Kryptographie** (German)
Martin Maas
Naturwissenschaftliche Rundschau, Issue 718.
- 2008 **Stegacrypt - eine modulare Steganographie-Software** (German)
Martin Maas
Naturwissenschaftliche Rundschau, Issue 718.

TECHNICAL REPORTS

- 2017 **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

THESES

- 2014 **PHANTOM: Practical Oblivious Computation in a Secure Processor** (MS Thesis, UC Berkeley, May 2014)
2011 **A JVM for the Barrelfish Operating System** (Part II Dissertation, University of Cambridge, May 2011)

PATENTS & PATENT APPLICATIONS

- 2017 **Dynamic Co-Scheduling of Hardware Contexts for Parallel Runtime Systems on Shared Machines**
Timothy Harris, Virendra Marathe, Martin Maas
U.S. Patent 9,542,221, filed May 22, 2014, and issued January 10, 2017
2015 **Coordinated Garbage Collection in Distributed Systems**
Timothy Harris, Martin Maas
U.S. Patent Application 14/723,425, filed May 27, 2015 (patent pending)

INVITED TALKS

- 2016 **A Java Virtual Machine for RISC-V: Porting the Jikes Research VM**
at 5th RISC-V Workshop, Mountain View, CA, November 30, 2016
2016 **FireBox: Designing the Warehouse-Scale Computer of 2020** (INVITED KEYNOTE)
at 1st Workshop on Hot Topics in Data Centers, Beijing, China, September 27, 2016
2016 **Offloading Garbage Collection to GPUs and Custom Hardware**
at Samsung R&D Austin, Austin, TX, April 13, 2017
at AMD Research, Bellevue, WA, August 30, 2016
2016 **Grail Quest: A New Proposal for Hardware-Assisted Garbage Collection**
at ASBD (ISCA Workshop), Seoul, Korea, June 19, 2016
2016 **Taurus: A Holistic Language Runtime System**
at ASPLOS, Atlanta, GA, April 5, 2016
2015 **Hardware and Software Support for Managed-language Workloads in Data Centers**
at University of Texas at Austin, Austin, TX, April 11, 2017
at University of California Santa Cruz, Santa Cruz, CA, March 2, 2017
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
2015 **Designing the 2020 Warehouse-Scale Computer from the Ground Up**
at Dagstuhl Seminar on Rack-Scale Computing, Schloss Dagstuhl, Germany, October 13, 2015
2014 **Trash Day: Coordinating Garbage Collection in Distributed Systems**
at HotOS, Kartause Ittingen, Switzerland, May 18, 2015
at Oracle Labs, Redwood Shores, CA, Wednesday, September 17, 2014
2014 **Ideas for the FireBox Software Stack**
at University of Cambridge, Cambridge, UK, August 12, 2014
at Microsoft Research, Cambridge, UK, July 25, 2014
2014 **The Case for the Holistic Language Runtime System**
at WRSC (EuroSys Workshop), Amsterdam, Netherlands, April 13, 2014
2013 **Callisto: Co-scheduling Parallel Runtime Systems**
at EuroSys 2014, Amsterdam, Netherlands, April 16, 2014
at University of Cambridge, Cambridge, UK, November 21, 2013
2013 **PHANTOM: A Parallel Architecture for Practical Oblivious Computation**
at CARL (MICRO Workshop), Davis, CA, December 7, 2013
at CCS, Berlin, Germany, November 5, 2013
at University of Cambridge, Cambridge, UK, June 11, 2013
at Microsoft Research, Redmond, WA, May 10, 2013
2012 **GPUs as an Opportunity for Offloading Garbage Collection**
at ISMM, Beijing, China, June 15, 2012
2012 **A JVM for the Barrelfish Operating System**
at SFMA (EuroSys Workshop), Bern, Switzerland, April 10, 2012
at University of Cambridge, Cambridge, UK, April 5, 2012