

# MALTE SCHWARZKOPF

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malte@csail.mit.edu

Date of Birth: 01/01/1988

Nationality: German

## EDUCATION AND QUALIFICATIONS

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### PhD in Computer Science

2009–2015

Specialized in operating systems and distributed systems, advised by Dr Steven Hand.

Dissertation title: “Operating system support for Warehouse-Scale Computing”.

Funded by a St John’s College Benefactors’ Scholarship and the DARPA MRC<sup>2</sup> program.

Systems Research Group, Computer Laboratory, University of Cambridge, UK

### BA (Hons.) in Computer Science (superseded by MA conferred May 10, 2013)

2006–2009

Results: Part IA: 2.i, Part IB: 1, Part II: 1 (ranked 2<sup>nd</sup> in year)

St John’s College, University of Cambridge, UK

### Abitur (German higher education entrance qualification)

1998–2006

Final grade: 1.0 (814/840) – Examined subjects: Mathematics, History, Biology, German.

Skipped a year in 1998/1999, entering second semester of year 6 after first semester of year 5.

Walddörfer-Gymnasium Hamburg, Germany

## EMPLOYMENT HISTORY

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### Massachusetts Institute of Technology, CSAIL, Postdoctoral Associate

since February 2016

Cambridge, MA, USA

- Research and teaching responsibilities in the Parallel and Distributed Operating Systems (PDOS) group.
- Working with Prof. M. Frans Kaashoek, Prof. Robert Morris, and Prof. Eddie Kohler (Harvard).

### St John’s College, Acting Director of Studies in Computer Science

October 2013–August 2014

### Peterhouse, Director of Studies in Computer Science

April 2014–August 2014

Cambridge, UK

- Coordinated undergraduate teaching for 18 (St John’s) and 3 (Peterhouse) Computer Science students.
- Responsible for overall academic conduct, organisation of small-group teaching and mentoring.

### Google, Inc., Engineering Intern (PhD)

June–November 2011 & February–May 2012

Mountain View, CA, USA

- Investigated optimistically concurrent scheduler design in the new Omega cluster management system.
- Implemented a MapReduce scheduler with support for opportunistic allocation of spare resources.
- Achieved 4.5× job completion speedup in the 50<sup>th</sup> percentile in simulation on a real workload trace.
- Work published at EuroSys 2013 and awarded *Best Student Paper* award (see below).

### Adjutem Software Solutions, Founder

since 2008

Cambridge, UK

- Bespoke software development consultancy, specialising in individually tailored room allocation and management software for use in Cambridge colleges.
- Clients include St John’s College, Cambridge and Peterhouse, Cambridge.

### Broadcom Europe Ltd., Engineering Intern

June–September 2008

Cambridge, UK

- Wrote a pixel-accurate software simulation framework (supporting OpenGL 1.1 shaders and content) for Broadcom’s next-generation video processor.
- Design, implementation and documentation of a complex simulation framework situated right at the core of Broadcom’s mobile multimedia business; first working implementation of the new platform.

- Developed a profiler for the 3D subsystem of the VideoCore III processor: gathering, compression and storage of debug and performance information plus visualisation in a powerful graphical front-end.
- Developed a general-purpose code emitter library for the VideoCore assembly language for use in an OpenGL shader compiler and attribute loader.

#### MAJOR PUBLICATIONS

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For a complete, up-to-date list of scientific publications, see <http://www.cl.cam.ac.uk/~ms705/pub/>.

- I. Gog, M. Schwarzkopf, A. Gleave, R.N.M. Watson and S. Hand. **Firmament: fast, centralized cluster scheduling at scale**. In *Proceedings of the 12<sup>th</sup> Symposium on Operating Systems Design and Implementation (OSDI)*, 2016. (To appear.)
- M.P. Grosvenor, M. Schwarzkopf, I. Gog, R.N.M. Watson, A. Moore, S. Hand and J. Crowcroft. **Queues don't matter when you can JUMP them!**. In *Proceedings of the 12<sup>th</sup> Symposium on Networked Systems Design and Implementation (NSDI)*, 2015. (BEST PAPER AWARD).
- I. Gog, M. Schwarzkopf, N. Crooks, M.P. Grosvenor, A. Clement and S. Hand. **Musketeer: all for one, one for all in data processing systems**. In *Proceedings of the 10<sup>th</sup> European Conference on Computer Systems (EuroSys)*, 2015.
- M. Schwarzkopf, M.P. Grosvenor and S. Hand. **New wine in old skins: the case for distributed operating systems in the data center**. In *Proceedings of the 4<sup>th</sup> Asia-Pacific Workshop on Systems (APSYS)*, 2013.
- M. Schwarzkopf, A. Konwinski, M. Abd-El-Malek and J. Wilkes. **Omega: flexible, scalable schedulers for large compute clusters**. In *Proceedings of the 8<sup>th</sup> European Conference on Computer Systems (EuroSys)*, 2013. (BEST STUDENT PAPER AWARD).
- M. Schwarzkopf, D.G. Murray and S. Hand. **The seven deadly sins of cloud computing research**. In *Proceedings of the 4<sup>th</sup> Workshop on Hot Topics in Cloud Computing (HotCloud)*, 2012.
- D.G. Murray, M. Schwarzkopf, C. Snowton, S. Smith, A. Madhavapeddy and S. Hand. **CIEL: a universal execution engine for distributed data-flow computing**. In *Proceedings of the 8<sup>th</sup> Symposium on Networked System Design and Implementation (NSDI)*, 2011.

#### COMMUNITY SERVICE

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- WWW 2017 Program Committee member (Systems & Infrastructure Track)** *from Oct. 2016*
- EuroSys 2016 Program Committee member (light)** *Oct. 2015–Mar. 2016*
- PLDI 2015 Artifact Evaluation Committee member** *Feb.–April 2015*
- Other program committees:** TinyToCS (Tiny Transactions on Computer Science), vol. 2 (2013), vol. 3 (2015), and vol. 4 (2016); EuroSys 2013 shadow PC.

#### TEACHING

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- Director of Studies in Computer Science**, Peterhouse, Cambridge *April–September 2014*  
Coordination of undergraduate teaching and academic oversight of Computer Science students.
- Acting Director of Studies in Computer Science**, St John's College, Cambridge *2013–2014*  
Coordinating undergraduate admissions and teaching during Dr Robert Mullins's sabbatical leave.
- Supervisor for undergraduate final year dissertations**, Computer Laboratory, Cambridge *2010–2015*  
Oversaw conception, execution and evaluation of independent student projects; 7/10 projects at first class grade; 5/10 in received awards or were specially commended (coming in the top five in class).
- Supervisor for Computer Science undergraduates**, Computer Laboratory, Cambridge *2009–2013*  
Small-group teaching in courses including Computer Fundamentals, Operating Systems, Object-Oriented Programming, C/C++, Java and Advanced Systems Topics.

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## AWARDS AND OTHER NOTABLE ACHIEVEMENTS

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- Best paper award** at the Symposium on Networked Systems Design and Implementation (NSDI) for my paper entitled *Queues don't matter when you can JUMP them!*. May 2015
- Best student paper award** at the European Conference on Computer Systems (EuroSys) for my paper entitled *Omega: flexible, scalable schedulers for large compute clusters*. April 2013
- EuroSys student travel award** to attend the Symposium on Operating Systems Principles (SOSP) in Cascais, Portugal. July 2011
- Received **student travel grants** to attend several conferences:
- USENIX Symposium on Networked Systems Design and Implementation May 2015
  - ACM SIGOPS European Conference on Computer Systems (EuroSys) April 2015
  - ACM Symposium on Operating Systems Principles (SOSP) October 2013
  - ACM SIGOPS European Conference on Computer Systems (EuroSys) April 2013
  - USENIX Workshop on Hot Topics in Cloud Computing (HotCloud) June 2012
  - USENIX File and Storage Technologies Conference (FAST) February 2011
  - USENIX Annual Technical Conference (ATC) June 2010
  - ACM SIGOPS European Conference on Computer Systems (EuroSys) April 2010
- Awarded the **Hockin, Hughes and Wright prizes for academic distinction** for coming 2<sup>nd</sup> in final year examinations; re-elected as scholar. July 2009
- Awarded a **College prize for Computer Science** for performance in second year examinations; elected **scholar** of St John's College. July 2008
- Admitted to membership of the **German National Academic Foundation** ("Studenstiftung des deutschen Volkes"). early 2007
- Named "distinguished former student and honorary member of teaching staff" upon leaving the Walddörfer-Gymnasium Hamburg. June 2006

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## OTHER ACTIVITIES AND POSITIONS OF RESPONSIBILITY

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- Organiser and convener** of the *Operating Systems Reading group* at the Computer Laboratory. 2012–2014
- Vice President** of the St John's College JCR Committee. 2009–2010
- Chairman** of the Student-Run Computing Facility (SRCF) in Cambridge. 2009–2010
- Computing Officer** on the St John's College JCR Committee (two terms). 2007–2009
- President** of the Wilkes Society (then "St John's College Computer Science Society"). 2008–2009
- Treasurer** and system administrator for the Student-Run Computing Facility (SRCF) in Cambridge. 2008–2009
- Editor-in-Chief** for the yearbook of the class of 2006 at the Walddörfer-Gymnasium Hamburg. 2005–2006

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## LANGUAGES

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**English:** fluent — **German:** native speaker — **French:** conversational — **Latin:** rudimentary

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## OTHER INTERESTS

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- I am interested in **history**, particularly the history of ancient Rome and Greece, and history of science.
- Actively following contemporary domestic and interational **politics**. I take a special interest in the European unification process, citizen rights and freedom of information.

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## REFERENCES

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References are available upon request.