CURRICULUM VITAE

CHRISTOPH M. KIRSCH

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RESEARCH INTERESTS

Principled engineering of software systems

Embedded, real-time, concurrent, and mobile programming

Memory management and virtual execution environments

EDUCATION

October 1999	Dr.-Ing., Saarland University While at the Max Planck Institute for Computer Science Saarbrücken, Germany (Advisor: Prof. Harald Ganzinger)
March 1996	Dipl.-Inform., Saarland University While at the Max Planck Institute for Computer Science Saarbrücken, Germany (Advisor: Prof. Hans-Jürgen Ohlbach)

ACADEMIC EMPLOYMENT

Since September 2008	Visiting Scholar (Sponsor: Prof. Raja Sengupta) Department of Civil and Environmental Engineering University of California at Berkeley Berkeley, California, USA
Since April 2004	Full Professor and Chair of the Computational Systems Group Department of Computer Sciences University of Salzburg Salzburg, Austria
May 2003—March 2004	Assistant Research Engineer (Sponsor: Prof. Thomas Henzinger) Department of Electrical Engineering and Computer Sciences University of California at Berkeley Berkeley, California, USA
November 1999—April 2003	Postdoctoral Researcher (Sponsor: Prof. Thomas Henzinger) Department of Electrical Engineering and Computer Sciences University of California at Berkeley Berkeley, California, USA
March 1996—October 1999	Research Assistant (Sponsor: Prof. Harald Ganzinger) Max Planck Institute for Computer Science Saarbrücken, Germany

AWARD

2007 IBM Faculty Award

PUBLICATIONS

CONFERENCE AND WORKSHOP PAPERS

[1] M. Aigner and C.M. Kirsch. ACDC: Towards a universal mutator for benchmarking heap management systems. In *Proc. International Symposium on Memory Management (ISMM)*. ACM, 2013.

[2] E. Pereira, C. Potiron, C.M. Kirsch, and R. Sengupta. Modeling and controlling the structure of heterogeneous mobile robotic systems: A bigactor approach. In *International Systems Conference (SysCon)*. IEEE, 2013. Click here for PDF file.

[3] E. Pereira, C.M. Kirsch, R. Sengupta, and J. Borges de Sousa. BigActors - a model for structure-aware computation. In *Proc. International Conference on Cyber-Physical Systems (ICCPS)*. ACM, 2013. Click here for PDF file.

[4] T.A. Henzinger, C.M. Kirsch, H. Payer, A. Sezgin, and A. Sokolova. Quantitative relaxation of concurrent data structures. In *Proc. Symposium on Principles of Programming Languages (POPL)*. ACM, 2013. Click here for PDF file.

[5] S.S. Craciunas and C.M. Kirsch. The power of isolation. In *Proc. International Conference on Embedded and Ubiquitous Computing (EUC)*. IEEE, 2012. Click here for PDF file.

[6] A. Haas, C.M. Kirsch, M. Lippautz, and H. Payer. How fifo is your concurrent fifo queue? In *Proc. OOPSLA Workshop on Relaxing Synchronization for Multicore and Manycore Scalability (RACES)*, 2012. Click here for PDF file.

[7] C.M. Kirsch, H. Payer, H. Röck, and A. Sokolova. Performance, scalability, and semantics of concurrent FIFO queues. In *Proc. International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP)*, LNCS. Springer, 2012. Click here for PDF file.

[8] C.M. Kirsch and H. Payer. Incorrect systems: It's not the problem, it's the solution. In *Proc. Design Automation Conference (DAC)*. ACM, 2012. Click here for PDF file.

[9] C.M. Kirsch, E. Pereira, R. Sengupta, H. Chen, R. Hansen, J. Huan, F. Landolt, M. Lippautz, A. Rottmann, R. Swick, R. Trummer, and D. Vizzini. Cyber-physical cloud computing: The binding and migration problem. In *Proc. International Conference on Design, Automation and Test in Europe (DATE)*, 2012. Click here for PDF file.

[10] C.M. Kirsch, H. Payer, and H. Röck. Hierarchical PLABs, CLABs, TLABs in Hotspot. In *Proc. International Conference on Systems (ICONS)*, 2012. Click here for PDF file.

[11] H. Chen, R. Hansen, J. Huang, E. Pereira, R. Swick, D. Vizzini, R. Sengupta, C. M. Kirsch, F. Landolt, M. Lippautz, A. Rottmann, and R. Trummer. Cloud computing on wings: Applications to air quality. In *Proc. American Astronautical Society Guidance and Control Conference (AASGNC)*. AAS, 2012.

[12] C.M. Kirsch, L. Lopes, E.R.B. Marques, and A. Sokolova. Runtime programming through model-preserving, scalable runtime patches. In *Proc. International Conference on Application of Concurrency to System Design (ACSD)*, pages 77–86. IEEE, 2011. Click here for PDF file.

[13] C.M. Kirsch, H. Payer, H. Röck, and A. Sokolova. Brief announcement: Scalability versus semantics of concurrent FIFO queues. In *Proc. Symposium on Principles of Distributed Computing (PODC)*, pages 331–332. ACM, 2011. Click here for PDF file.

[14] M. Aigner, A. Haas, C.M. Kirsch, M. Lippautz, A. Sokolova, S. Stroka, and A. Unterweger. Short-term memory for self-collecting mutators. In *Proc. International Symposium on Memory Management (ISMM)*. ACM, 2011. Click here for PDF file.

[15] C.M. Kirsch, L. Lopes, E.R.B. Marques, and A. Sokolova. Runtime programming through model-preserving, scalable runtime patches. In *Proc. International Workshop on Formal Aspects of Component Software (FACS), Doctoral Track*, volume 6921 of *LNCS*, pages 290–294. Springer, 2010. Click here for PDF file.

[16] S.S. Craciunas, C.M. Kirsch, and A. Sokolova. Power-aware temporal isolation with variable-bandwidth servers. In *Proc. International Conference on Embedded Software (EMSOFT)*. ACM, 2010. Click here for PDF file.

[17] S.S. Craciunas, A. Haas, C.M. Kirsch, H. Payer, H. Röck, A. Rottmann, A. Sokolova, R. Trummer, J. Love, and R. Sengupta. Information-acquisition-as-a-service for cyber-physical cloud computing. In *Proc. Workshop on Hot Topics in Cloud Computing (HotCloud)*. USENIX, 2010. Click here for PDF file.

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[23] K. Hedrick, J. Jariyasunant, C.M. Kirsch, J. Love, E. Pereira, R. Sengupta, and M. Zennaro. CSL: A language to specify and re-specify mobile sensor network behaviors. In *Proc. Real-Time and Embedded Technology and Applications Symposium (RTAS)*. IEEE, 2009. Click here for PDF file.

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[26] S.S. Craciunas, C.M. Kirsch, H. Röck, and R. Trummer. The JAviator: A high-payload quadrotor UAV with high-level programming capabilities. In *Proc. AIAA Guidance, Navigation and Control Conference (GNC)*, 2008. Click here for PDF file.

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JOURNAL PAPERS

[1] S.S. Craciunas, C.M. Kirsch, H. Payer, H. Röck, and A. Sokolova. Temporal isolation in real-time systems: The VBS approach. *To Appear in Software Tools for Technology Transfer*, 2012. Click here for PDF file.

[2] A. Ghosal, D. Iercan, C.M. Kirsch, T.A. Henzinger, and A. Sangiovanni-Vincentelli. Separate compilation of hierarchical real-time programs into linear-bounded Embedded Machine code. *Science of Computer Programming*, 77(2):96–112, 2012.

[3] J. Auerbach, D.F. Bacon, D. Iercan, C.M. Kirsch, V.T. Rajan, H. Röck, and R. Trummer. Low-latency time-portable real-time programming with Exotasks. *ACM Transactions on Embedded Computing Systems (TECS)*, 8(2):1–48, January 2009.

[4] S.S. Craciunas, C.M. Kirsch, and H. Röck. I/O Resource management through system call scheduling. *ACM Operating Systems Review (OSR), Special Issue on Research and Developments in the Linux Kernel*, July 2008. Click here for PDF file.

[5] T.A. Henzinger and C.M. Kirsch. The Embedded Machine: Predictable, portable real-time code. *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 29(6):33–61, October 2007.

[6] T.A. Henzinger, B. Horowitz, and C.M. Kirsch. Giotto: A time-triggered language for embedded programming. *Proceedings of the IEEE*, 91(1):84–99, January 2003. Click here for PDF file.

[7] T.A. Henzinger, C.M. Kirsch, M.A.A. Sanvido, and W. Pree. From control models to real-time code using Giotto. *IEEE Control Systems Magazine (CSM)*, 23(1):50–64, February 2003. Click here for PDF file.

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[1] D.F. Bacon, P. Cheng, D. Grove, M. Hind, V.T. Rajan, E. Yahav, M. Hauswirth, C.M. Kirsch, D. Spoonhauer, and M.T. Vechev. High-level real-time programming in Java. In *Proc. International Conference on Embedded Software (EMSOFT)*. ACM, 2005. Click here for PDF file.

[2] C.M. Kirsch. Principles of real-time programming. In *Proc. International Workshop on Embedded Software (EMSOFT)*, volume 2491 of *LNCS*, pages 61–75. Springer, 2002. Click here for PDF file.

PROCEEDINGS

[1] Gernot Heiser and Christoph M. Kirsch, editors. *ACM European Conference on Computer Systems, EuroSys 2011, Salzburg, Austria, April 10 - 13, 2011, Proceedings*, New York, NY, USA, 2011. ACM.

[2] Christoph M. Kirsch and Mahmut T. Kandemir, editors. *ACM SIGPLAN/SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems, LCTES 2009, Dublin, Ireland, June 19 - 20, 2009, Proceedings*, New York, NY, USA, 2009. ACM.

[3] Christoph M. Kirsch and Reinhard Wilhelm, editors. *ACM & IEEE International Conference on Embedded Software, EMSOFT 2007, Salzburg, Austria, September 30 - October, 3, 2007, Proceedings*, New York, NY, USA, 2007. ACM.

[4] Thomas A. Henzinger and Christoph M. Kirsch, editors. *Embedded Software, First International Workshop, EMSOFT 2001, Tahoe City, CA, USA, October, 8-10, 2001, Proceedings*, volume 2211 of *LNCS*. Springer, 2001.

BOOK CHAPTERS

[1] C.M. Kirsch and A. Sokolova. The logical execution time paradigm. In *Advances in Real-Time Systems*, pages 103–120, 2012.

[2] I. Lee, J. Leung, and S.H. Son, editors. *Handbook of Real-Time and Embedded Systems*, chapter The Evolution of Real-Time Programming. CRC Press, 2007.

[3] T. Samad and G. Balas, editors. *Software-Enabled Control: Information Technology for Dynamical Systems*, chapter "Embedded Control Systems Development with Giotto". IEEE Press and Wiley-Interscience, 2003.

SYSTEM PAPERS

[1] R. Alur, L. de Alfaro, R. Grosu, T.A. Henzinger, M. Kang, C.M. Kirsch, R. Majumdar, F. Mang, and B.Y. Wang. jmocha: A model checking tool that exploits design structure. In *Proc. International Conference on Software Engineering (ICSE)*, 2001. Click here for PDF file.

[2] C. Weidenbach, C. Meyer, C. Cohrs, T. Engel, and E. Keen. SPASS v0.77. *Journal of Automated Reasoning*, 21(1), 1998.

POSTERS

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[2] S.S. Craciunas, C.M. Kirsch, H. Payer, H. Röck, and A. Sokolova. Everyone virtualizes everything but time. Poster at the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), 2009. Click here for PDF file.

TECHNICAL REPORTS

[1] C.M. Kirsch, M. Lippautz, and H. Payer. Fast and scalable k-fifo queues. Technical Report 2012-04, Department of Computer Sciences, University of Salzburg, June 2012. Click here for PDF file.

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THESES

[1] C. Meyer. *Soft Typing for Clausal Inference Systems*. Phd thesis, Saarland University, Saarbrücken, Germany, 1999. Click here for PDF file.

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SOFTWARE

1. The Scal Project: High-Performance, Multicore-Scalable Data Structures, with Andreas Haas, Thomas A. Henzinger, Michael Lippautz, Hannes Payer, Ali Sezgin, and Ana Sokolova. Web: `http://scal.cs.uni-salzburg.at`
2. The Tiptoe Project: A Compositional Real-Time Operating System, with Silviu Craciunas, Hannes Payer, Harald Röck, Ana Sokolova, and Horst Stadler. Web: `http://tiptoe.cs.uni-salzburg.at`
3. The Jarol Project: A Java Infrastructure for Control Systems, with Bernhard Kast, Eduardo Marques, and Rainer Trummer. Web: `http://jarol.cs.uni-salzburg.at`
4. The JAviator Project: Quadrotor UAV Software Entirely Written in Java, with Joshua Auerbach, David Bacon, Harald Röck, and Rainer Trummer. Web: `http://javiator.cs.uni-salzburg.at`
5. The TAP Project: Concurrent Programming with Threading by Appointment, with Silviu Craciunas and Harald Röck. Web: `http://tap.cs.uni-salzburg.at`
6. The HTL Project: Compositional Real-Time Programming in a Hierarchical Timing Language, with Arkadeb Ghosal, Thomas A. Henzinger, Daniel Iercan, and Alberto L. Sangiovanni-Vincentelli. Web: `http://htl.cs.uni-salzburg.at`

7. Giotto: An Embedded Programming Language, Compiler, and Runtime System for Distributed Control Systems, with Arkadeb Ghosal, Thomas A. Henzinger, Slobodan Matic, and Marco A.A. Sanvido. Web: `http://embedded.eecs.berkeley.edu/giotto`

8. jMocha: A Model Checking Tool that Exploits Design Structure, with Rajeev Alur, Luca de Alfaro, Radu Grosu, Thomas A. Henzinger, Minsu Kang, Rupak Majumdar, Freddy Mang, and Bow-Yaw Wang. Web: `http://embedded.eecs.berkeley.edu/research/mocha`

9. SPASS v0.77: An Automated Theorem Prover for First-Order Logic with Equality, with Christoph Weidenbach, Christian Cohrs, Thorsten Engel, and Enno Keen. Web: `http://spass.mpi-sb.mpg.de`

10. PURR: Parallel Unit Resulting Resolution, a concurrent first-order theorem prover with advanced indexing operations, see Master's Thesis.

11. ACID: A Collection of Indexing Data Structures, implemented in C and Prolog, with Peter Graf.

HARDWARE

1. The JAviator: A Quadrotor Helicopter and Software Laboratory for Time-Portable Java Programming, with Rainer Trummer. Web: `http://javiator.cs.uni-salzburg.at`

TALKS

INVITED TALKS

1. *Inexact Software Is the Solution*, CASA Workshop, Tampere, Finland, October 2012. Click here for PDF file.

2. *Incorrect Systems: It's not the Problem, It's the Solution*, EC2 Workshop, Berkeley, California, July 2012. Click here for PDF file.

3. *Incorrect Systems: It's not the Problem, It's the Solution*, Austrian Computer Science Day, University of Vienna, Austria, June 2012. Click here for PDF file.

4. *Virtualizing Time, Space, and Power for Cyber-Physical Cloud Computing*, ARTIST Workshop on Rigorous Embedded Design, Salzburg, Austria, April 2011. Click here for PDF file.

5. *Short-term Memory for Self-collecting Mutators: Towards Time- and Space-predictable Virtualization*, Computer Science Symposium, IST Austria, Klosterneuburg, Austria, May 2010. Click here for PDF file.

6. *Tiptoe: A Compositional Real-Time Operating System (Memory Management)*, ARTIST Workshop on Foundations and Applications of Component-Based Design, Salzburg, Austria, September 2007. Click here for PDF file.

7. *Trends and Challenges in Embedded Systems Research*, Österreichische Forschungsförderungsgesellschaft (FFG), Vienna, Austria, May, 2007. Click here for PDF file.

8. *Shaping Process Semantics (and the JAviator: A Flying MoCC Laboratory)*, ARTIST Workshop on Models of Computation and Communication, Zürich, Switzerland, November 2006. Click here for PDF file

9. *Shaping Process Semantics*, Monterey Workshop on Composition of Embedded Systems: Scientific and Industrial Issues, Paris, France, October 2006. Click here for PDF file.

10. *Threading by Appointment*, Monterey Workshop on Software Engineering Tools: Compatibility and Integration, Vienna, Austria, October 2004. Click here for PDF file.

11. *Embedded Systems Frontiers*, Bundesministerium für Verkehr, Innovation und Technologie, Vienna, Austria, July 2003. Click here for PDF file.

12. *Principles of Real-Time Programming*, Second International Workshop on Embedded Software (EMSOFT), Grenoble, France, October 2002. Click here for PDF file.

PANELS

1. *Vehicular Wireless Networks: What should the future hold?*, International Symposium on Wireless Vehicular Communications (WiVeC), San Francisco, California, September 2011.

2. *Collaboration and Virtualization in Cyber-Physical Systems*, CPS Forum, Cyber-Physical Systems Week, San Francisco, California, April 2009. Click here for PDF file

COLLOQUIA

1. *Time-Portable Programming the JAviator in Tiptoe OS*, Department of Computer Science and Engineering, UC Riverside, California, October 2008. Click here for PDF file.

2. *Tiptoe: A Compositional Real-Time Operating System (Memory Management)*, Center for Embedded Computer Systems, UC Irvine, California, March 2008. Click here for PDF file.

SUMMER SCHOOLS

1. *Virtualizing Time, Space, and Power for Cyber-Physical Cloud Computing*, Georgia Tech Summer School on Cyber-Physical Systems, Atlanta, Georgia, USA, June, 2011. Click here for PDF file.

2. *Explicit, Dynamic Memory Management with Temporal and Spatial Guarantees*, ARTIST Summer School on Embedded Systems Design, Buenos Aires, Argentina, August 2009. Click here for PDF file.

3. *Explicit, Dynamic Memory Management with Temporal and Spatial Guarantees*, ARTIST Summer School on Embedded Systems Design, Beijing, China, July 2009. Click here for PDF file.

4. *Designing a Compositional Real-Time Operating System*, ARTIST Summer School on Embedded Systems Design, Shanghai, China, July 2008. Click here for PDF file.

5. *From Control Models to Real-Time Code Using Giotto*, Summer School on Embedded Systems (EmSys), Salzburg, Austria, June 2003. Click here for PDF file.

6. *Principles of Real-Time Programming*, Summer School on Embedded Systems (EmSys), Salzburg, Austria, June 2003. Click here for PDF file.

TUTORIAL

1. *The Logical Execution Time Paradigm*, Tutorials on Time-Predictable and Composable Architectures for Dependable Embedded Systems, ESWEEK, Taipei, Taiwan, October 2011. Click here for PDF file.

SEMINARS

1. *Distributed Queues: Faster Pools and Better Queues*, Oracle, Belmont, California, December 2012. Click here for PDF file.

2. *Distributed Queues: Faster Pools and Better Queues*, Stanford University, Palo Alto, California, December 2012. Click here for PDF file.

3. *Incorrect Systems: It's not the Problem, It's the Solution*, DREAMS Seminar, UC Berkeley, Berkeley, California, July 2012. Click here for PDF file.

4. *The Next Frontier of Cloud Computing is in the Clouds, Literally*, AI-Systems-Robotics Seminar, CS Department, Cornell University, Ithaca, New York, February 2011. Click here for PDF file.

5. *The Next Frontier of Cloud Computing is in the Clouds, Literally*, CS Department, UC Davis, Davis, California, February 2011. Click here for PDF file.

6. *Scal☠: Non-Linearizable Computing Breaks the Scalability Barrier*, Center for Hybrid and Embedded Software Systems, UC Berkeley, Berkeley, California, November 2010. Click here for PDF file.

7. *Short-term Memory for Self-collecting Mutators*, Center for Hybrid and Embedded Software Systems, UC Berkeley, Berkeley, California, September 2010. Click here for PDF file.

8. *The Next Frontier of Cloud Computing is in the Clouds, Literally*, Google Tech Talk, Mountain View, California, September 2010. Click here for PDF file.

9. *Short-term Memory for Self-collecting Mutators*, CSAIL, MIT, Boston, Massachusetts, May 2010. Click here for PDF file.

10. *Distributed, Modular HTL*, Department of Electrical Engineering and Information Technology, Technical University of Munich, Munich, Germany, June 2009. Click here for PDF file.

11. *Time-Portable Programming the JAviator in the Tiptoe VM*, Center for Hybrid and Embedded Software Systems, UC Berkeley, Berkeley, California, January 2009. Click here for PDF file.

12. *The JAviator: Time-Portable Programming in Java and C*, Hitachi Global Storage Technologies, San Jose, California, September 2008. Click here for PDF file.

13. *The JAviator: Time-Portable Programming in Java*, Sun Microsystems, Palo Alto, California, September 2008. Click here for PDF file.

14. *Tiptoe: A Compositional Real-Time Operating System (Process Model and Scheduler)*, EPFL, Lausanne, Switzerland, May 2008. Click here for PDF file.

15. *Tiptoe: A Compositional Real-Time Operating System (Process Model and Scheduler)*, ETHZ, Zürich, Switzerland, May 2008. Click here for PDF file.

16. *Tiptoe: A Compositional Real-Time Operating System (Memory Management)*, IBM T.J. Watson Research Center, Hawthorne, New York, September 2007. Click here for PDF file.

17. *Time-Portable Real-Time Programming with Exotasks*, Center for Hybrid and Embedded Software Systems, UC Berkeley, Berkeley, California, February 2007. Click here for PDF file.

18. *An Introduction to Logical Execution Time Programming*, Center for Collaborative Control of Unmanned Vehicles, UC Berkeley, Berkeley, California, September 2006. Click here for PDF file.

19. *High-Level Programming of Real-Time Software Systems*, University of Lugano, Lugano, Switzerland, March 2006. Click here for PDF file.

20. *The JAviator Project*, Center for Hybrid and Embedded Software Systems, UC Berkeley, Berkeley, California, February 2006. Click here for PDF file.

21. *High-Level Programming of Real-Time and Concurrent Software Systems*, Purdue University, West Lafayette, Indiana, December 2005. Click here for PDF file.

22. *Traffic Shaping System Calls Using Threading by Appointment*, UC Berkeley, Berkeley, California, September 2005. Click here for PDF file.

23. *Traffic Shaping System Calls Using Threading by Appointment*, UCLA, Los Angeles, California, August 2005. Click here for PDF file.

24. *The Embedded Machine: Status and Future Directions*, IBM T.J. Watson Research Center, Hawthorne, New York, March 2005. Click here for PDF file.

25. *Threading by Appointment*, Center for Collaborative Control of Unmanned Vehicles, UC Berkeley, Berkeley, California, February 2005. Click here for PDF file.

26. *Real-Time Programming Based on Schedule-Carrying Code*, McGill University, Montreal, Canada, January, 2004. Click here for PDF file.

27. *The Embedded Machine: Predictable, Portable Real-Time Code*, Verimag, Grenoble, France, November 2001. Click here for PDF file.

28. *Giotto: A Time-triggered Language for Embedded Programming*, Honeywell, Minneapolis, Minnesota, September 2001. Click here for PDF file.

29. *Embedded Control Systems Development with Giotto*, Stanford University, Palo Alto, California, November 2000. Click here for PDF file.

GROUP

POSTDOCS

Rainer Trummer, Dr. Tech., University of Salzburg (since 2011); Ana Sokolova, PhD, Technical University of Eindhoven (since 2007).

PHD STUDENTS

Martin Aigner (since 2012); Andreas Haas (since 2009); Clemens Krainer (since 2009); Michael Lippautz (since 2011).

GRADUATED PHD STUDENTS

Hannes Payer, Dr. Tech., University of Salzburg, 2012 (*Multicore Scalability of Concurrent Objects*); Harald Röck, Dr. Tech., University of Salzburg, 2012 (*Tiptoe: A Virtual Execution Environment for Real-Time and Embedded Systems*); Eduardo Marques, PhD, University of Porto, 2011, co-advised (*Runtime Programming*); Rainer Trummer, Dr. Tech., University of Salzburg, 2011 (*Design and Implementation of the JAviator Quadrotor - An Aerial Software Testbed*); Silviu Craciunas, Dr. Tech., University of Salzburg, 2010 (*Programmable Temporal Isolation for High-Performance and Real-Time Systems*); Daniel Iercan, PhD, Technical University of Timisoara, 2008, co-advised (*Contributions to the Development of Real-Time Programming Techniques and Technologies*).

MASTERS STUDENTS

Andreas Rottmann (since 2010); Andreas Löcker (since 2007).

GRADUATED MASTERS STUDENTS

Martin Aigner, Dipl.-Ing., University of Salzburg, 2012 (*Short-term Memory for the C Programming Language*); Stephanie Stroka, Dipl.-Ing., University of Salzburg, 2012 (*Short-term Regions: A Region-based Short-term Memory Allocator*); Michael Lippautz, Dipl.-Ing., University of Salzburg, 2011 (*Self-collecting Goroutines: Short-term Memory Management in Go*); Florian Landolt, Dipl.-Ing., University of Salzburg, 2011 (*High-Throughput Inter-Domain Multicast on the Xen Hypervisor*); Andreas Unterweger, Dipl.-Ing., University of Salzburg, 2011 (*Performance Analysis of Short-Term Memory in a State-of-the-Art H.264 Video Encoder*); Clemens Krainer, Dipl.-Ing., University of Salzburg, 2009 (*JNavigator - An Autonomous Navigation System for the JAviator Quadrotor Helicopter*); Andreas Haas, Dipl.-Ing., University of Salzburg, 2009 (*Expiration Classes for Implicit Memory Management*); Wolfgang Kreil, Dipl.-Ing., University of Salzburg, 2009 (*Cubic UWB-based Soft Walls for a Micro-UAV*); Horst Stadler, Dipl.-Ing., University of Salzburg, 2008 (*A Virtualized Real-Time I/O Subsystem*); Hannes Payer, Dipl.-Ing., University of Salzburg, 2007 (*A Compacting Real-Time Memory Management System*); Bernhard Kast, Dipl.-Ing., University of Salzburg, 2007 (*Jarol: A Java Control Infrastructure*); Harald Röck, Dipl.-Ing., University of Salzburg, 2006 (*Threading by Appointment*); Marcus Harringer, Dipl.-Ing., University of Salzburg, 2005 (*Real-Time Java Programming with Logical Execution Times and Real-Time Garbage Collection*).

TEACHING

UNDERGRADUATE COURSES

Compiler Construction, University of Salzburg, Summer 2012. *Compiler Construction*, University of Salzburg, Summer 2011. *Compiler Construction*, University of Salzburg, Summer 2010. *Compiler Construction*, University of Salzburg, Summer 2009.

GRADUATE COURSES

Advanced Operating Systems, University of Salzburg, Winter 2011/2012; *Embedded Software Engineering*, University of Salzburg, Winter 2011/2012; *Embedded Software Engineering*, University of Salzburg, Winter 2010/2011; *Embedded Software Engineering*, University of Salzburg, Winter 2009/2010; *Advanced Operating Systems*, University of Salzburg, Winter 2009/2010; *Compiler Construction*, University of Salzburg, Summer 2008; *Operating Systems*, University of Salzburg, Winter 2007/2008; *Compiler Construction*, University of Salzburg, Summer 2007; *Embedded Software Engineering*, University of Salzburg, Winter 2006/2007; *Operating Systems*, University of Salzburg, Winter 2006/2007; *Compiler Construction*, University of Salzburg, Summer 2006; *Theory of Computational Systems*, University of Salzburg, Summer 2006; *Embedded Software Engineering*, University of Salzburg, Winter 2005/2006; *Operating Systems*, University of Salzburg, Winter 2005/2006; *Compiler Construction*, University of Salzburg, Summer 2005; *Theory of Computational Systems*, University of Salzburg, Summer 2005; *Computational Systems Engineering*, University of Salzburg, Winter 2004/2005; *Embedded Software Engineering*, University of Salzburg, Winter 2004/2005; *Embedded Software Engineering*, UC Berkeley (EECS290O), Spring 2002; *Embedded Software Engineering*, UC Berkeley (EECS290O), Spring 2001.

GRADUATE SEMINARS

Concurrency and Memory Management Seminar, University of Salzburg, Summer 2012; *Concurrency and Memory Management Seminar*, University of Salzburg, Winter 2010/2011; *Software Systems Seminar*, University of Salzburg, Summer 2010; *Software Systems Seminar*, University of Salzburg, Summer 2009; *Software Systems Seminar*, University of Salzburg, Summer 2008; *Compositionality Seminar*, University of Salzburg, Winter 2007/2008; *Software Systems Seminar*, University of Salzburg, Summer 2007; *Computational Systems Seminar*, University of Salzburg, Summer 2004.

PROFESSIONAL ACTIVITIES

CONFERENCE FOUNDER

Co-Founder, First International Workshop on Embedded Software (EMSOFT), Tahoe City, California, October 2001 (T. Henzinger, EPFL, Co-Founder).

MEMBER OF EDITORIAL BOARDS

Open Access Journal on Advances in Software Engineering (ASE); ACM Transactions on Design Automation of Electronic Systems (TODAES), 2011–2013.

GUEST EDITOR

Co-Editor, Special Issue on "Probabilistic Embedded Computing", ACM Transactions on Embedded Computing Systems, 2012 (to appear; V. Mooney, Georgia Institute of Technology, Co-Editor); Co-Editor, Special Issue on "ESWEEK 2007 Best Papers", Journal of Design Automation for Embedded Systems, 2009 (R. Wilhelm, Saarland University, Co-Editor).

PROFESSIONAL SOCIETIES

Chair, ACM Special Interest Group on Embedded Systems (SIGBED), 2011–2013; Treasurer, European Chapter of the ACM Special Interest Group on Operating Systems (SIGOPS), 2011–2013; Vice-Chair, ACM Special Interest Group on Embedded Systems (SIGBED), 2009–2011.

STEERING COMMITTEE CHAIR

Chair, ACM/IEEE International Conference on Embedded Software (EMSOFT), 2013 (W. Yi, Uppsala, Vice-Chair).

MEMBER OF CONFERENCE STEERING COMMITTEES

ACM SIGPLAN/SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES); ACM/IEEE International Conference on Embedded Software (EMSOFT); Embedded Systems Week (ESWEEK), 2007.

GENERAL CHAIR

General Chair, European Systems Conference (EuroSys), 2011; General Chair, ACM SIGPLAN/SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES), 2009; General Co-Chair, Embedded Systems Week (ESWEEK), 2008 (N. Dutt, UC Irvine, General Co-Chair).

ORGANIZING COMMITTEE CHAIR

Embedded Systems Week (ESWEEK), 2007.

SUMMER SCHOOL ORGANIZER

Co-Organizer, Summer School on Embedded Systems (EmSys), Salzburg, Austria, June 2003 (W. Pree, University of Salzburg, Co-Organizer).

SPECIAL SESSION ORGANIZER

Special Session on "Probabilistic Embedded Computing", Design Automation Conference (DAC), 2012; Special Session on "Virtualization in Embedded Systems", Design Automation Conference (DAC), 2011.

PROGRAM COMMITTEE CHAIR

Track Chair, "Embedded Systems Software", International Conference on Computer-Aided Design (ICCAD), 2012; Subcommittee Chair, "Embedded Software and Tools", Design Automation Conference (DAC), 2011; Topic Chair, "Model-Based Design for Embedded Systems", Design Automation and Test in Europe (DATE), 2011 (R. Majumdar, Max-Planck-Institute for Software Systems, Topic Co-Chair); Track Chair, "Design and Verification of Embedded Real-Time Systems", IEEE International Real-Time Systems Symposium (RTSS), 2010; Topic Co-Chair, "Model-Based Design for Embedded Systems", Design Automation and Test in Europe (DATE), 2010 (A. Benveniste, INRIA Rennes, Topic Co-Chair); PC Co-Chair, ACM/IEEE International Conference on Embedded Software (EMSOFT), 2007 (R. Wilhelm, Saarland University, PC Co-Chair).

MEMBER OF CONFERENCE PROGRAM COMMITTEES

ACM/IEEE International Conference on Embedded Software (EMSOFT), 2013; ACM International Conference on Computing Frontiers, 2013, Track on "Probabilistic Computing"; Design Automation and Test in Europe (DATE), 2013, Track on "Model-Based Design and Verification for Embedded Systems"; International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS 2012); ACM/IEEE International Conference on Formal Methods and Models for Codesign (MEMOCODE), 2012; IEEE/ACM International Conference on Computer-Aided Design (ICCAD), 2011, Track on "Embedded Systems Software"; IEEE International Real-Time Systems Symposium (RTSS), 2011, Track on "Design and Verification of Embedded Real-Time Systems"; ACM/IEEE International Conference on Embedded Software (EMSOFT), 2011; IEEE International Conference on Engineering of Complex Computer Systems (ICECCS), 2011; ACM/IEEE International Conference on Embedded Software (EMSOFT), 2010; ACM Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA), 2010; ACM/IEEE International Conference on Formal Methods and Models for Codesign (MEMOCODE), 2010; International Conference on Hybrid Systems: Computation and Control (HSCC), 2010; European Systems Conference (EuroSys), 2010; IEEE International Real-Time Systems Symposium (RTSS), 2009, Track on "Design and Verification of Embedded Real-Time Systems"; IEEE/ACM International Conference on Computer-Aided Design (ICCAD), 2009; IEEE/IFIP International Conference on Embedded and Ubiquitous Computing

(EUC), 2009, Track on "Embedded Systems and Hardware-Software Codesign"; ACM/IEEE International Conference on Embedded Software (EMSOFT), 2009; Design Automation and Test in Europe (DATE), 2009, Track on "Model-Based Design for Embedded Systems"; ACM/IEEE International Conference on Embedded Software (EMSOFT), 2008; IEEE Conference on Automation Science and Engineering (IEEE-CASE), 2008, Track on "Hybrid and Discrete Event Systems"; ACM SIGPLAN/SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES), 2008; IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), 2008, Track on "Real-Time and Embedded Applications / Benchmarks"; Design Automation and Test in Europe (DATE), 2008, Track on "Model-Based Design for Embedded Systems"; ACM/IEEE International Conference on Embedded Software (EMSOFT), 2007; Conference on Coordination Models and Languages (Coordination), 2007; Design Automation and Test in Europe (DATE), 2007, Track on "Model-Based Design for Embedded Systems"; European Systems Conference (EuroSys), 2007; International Conference on Software and Data Technologies (ICSOFT), 2006; Joint Modular Languages Conference (JMLC), 2006; ACM SIGPLAN/SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES), 2006; IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), 2006, Track on "Development, Verification, and Debug Tools for Real-Time and Embedded Systems"; European Systems Conference (EuroSys), 2006; ACM Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA), 2005; ACM International Conference on Embedded Software (EMSOFT), 2005; ACM/USENIX Conference on Virtual Execution Environments (VEE), 2005; ACM SIGPLAN/SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES), 2005; Joint Modular Languages Conference (JMLC), 2003.

MEMBER OF EXTERNAL REVIEW COMMITTEE

International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2010.

MEMBER OF WORKSHOP PROGRAM COMMITTEES

Workshop on Analytic Virtual Integration of Cyber-Physical Systems (AVICPS), 2012; Workshop on Adaptive and Reconfigurable Embedded Systems (APRES), 2012; Workshop on Java Technologies for Real-time and Embedded Systems (JTRES), 2011; Workshop on Adaptive and Reconfigurable Embedded Systems (APRES), 2011; Workshop on Java Technologies for Real-time and Embedded Systems (JTRES), 2010; Workshop on Adaptive and Reconfigurable Embedded Systems (APRES), 2009; Workshop on Adaptive and Reconfigurable Embedded Systems (APRES), 2008; Workshop on Automatic Program Generation for Embedded Systems (APGES), 2007; Workshop on Java Technologies for Real-time and Embedded Systems (JTRES), 2005.

MEMBER OF PHD COMMITTEES

Christos Sofronis, *Embedded Code Generation from High-Level Heterogeneous Components*, Université Joseph Fourier, Grenoble, France, 2006 (P. Caspi and S. Tripakis, Verimag, Advisors); Claudiu Farcas, *Towards Portable Real-Time Software Components*, University of Salzburg, Salzburg, Austria, 2006 (W. Pree, University of Salzburg, Advisor).

PROPOSAL REVIEWER

National Science Foundation (NSF); Portuguese Foundation for Science and Technology (FCT).

JOURNAL REVIEWER

IEEE Transactions on Computers; ACM Transactions on Programming Languages and Systems; ACM Transactions on Embedded Computing Systems; Journal of Systems Architecture; Journal of Applied Logic; Journal of Logic and Computation; Science of Computer Programming; ETRI Journal; IEEE Computer Magazine; IEEE Control Systems Magazine; IEEE Transactions on Software Engineering; IEEE Transactions on Robotics and Automation; International Journal of Foundations of Computer Science; IEEE Transactions on Vehicular Technology.

CONFERENCE REVIEWER

International Symposium on Distributed Autonomous Robotic Systems (DARS), 2012; ACM Symposium on Principles of Programming Languages (POPL), 2008; International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), 2005; International Conference on Real-Time and Embedded Computing Systems and Applications (RTCSA), 2004; IEEE International Real-Time Systems Symposium (RTSS), 2003; ACM Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES), 2003; ACM Conference on Programming Language Design and Implementation (PLDI), 2003; International Workshop on Embedded Software (EMSOFT), 2002; International Workshop on Computer Science Logic (CSL), 1999; International Conference on Automated Deduction (CADE), 1999; International Conference on Rewriting Techniques and Applications (RTA), 1998; International Workshop on Computer Science Logic (CSL), 1997; International Conference on Automated Deduction (CADE), 1997; International Conference on Rewriting Techniques and Applications (RTA), 1997.

RESEARCH GRANTS

NATIONAL (AUSTRIA)

- Co-Principal Investigator, *Rigorous Systems Engineering* (National Research Network), Austrian Science Fund (FWF), Grant S11404-N23 (R. Bloem, TU Graz, Speaker), 3/2011–2/2015, EUR 328,230.-
- Principal Investigator, *ArtistDesign* (Supplemental Support), Austrian Federal Ministry of Science and Research, Grant 651.394/0001-II/2/2009, 11/2009–12/2011, EUR 4,898.-
- Principal Investigator, *Embedded Systems Week 2007*, Österreichische Forschungsförderungsgesellschaft(FFG), FIT-IT Initiative, Grant 812443, 10/2006–10/2007, EUR 25,000.-
- Principal Investigator, *Concurrent Programming with Threading by Appointment*, Austrian Science Fund (FWF), Grant P18913-N15, 5/2006–4/2010, EUR 352,390.49
- Co-Principal Investigator, *DES Center—Dependable Embedded Systems Center*, Österreichische Forschungsförderungsgesellschaft (FFG), FIT-IT Initiative, Grant 809242 (H. Kopetz, TU Vienna, Co-PI), 2/2005–1/2006, EUR 20,000.-

INTERNATIONAL

- Senior Personnel, *CPS: Medium: Making Cloud Computing Sense, Act, and Move (SAM)*, National Science Foundation (NSF), Grant CNS-1136141 (R. Sengupta, UC Berkeley, PI; K. Hedrick, UC Berkeley, Co-PI), 9/2011–8/2014, US$1,100,000.-
- Co-Principal Investigator, *Short-term Memory Lifespan Estimation and Runtime*, Österreichischer Austauschdienst (OeAD), Grant AR 16/2011 (S. Yovine, University of Buenos Aires, Co-PI), 6/2011–5/2013, EUR 5,600.-
- Core Partner, *ArtistDesign*, European Commission, Network of Excellence (NoE), 1/2008–12/2011, EUR 78,368.-
- Principal Investigator, *The JAviator Project*, IBM T.J. Watson Research Center, Hawthorne, NY, USA, 2006–2007, US$ 55,000.-

REFERENCES

- Rajeev Alur, Professor, University of Pennsylvania, USA, alur@cis.upenn.edu
- Thomas A. Henzinger, Professor, Institute of Science and Technology Austria, tah@ist.ac.at
- Edward A. Lee, Professor, University of California, Berkeley, USA, eal@eecs.berkeley.edu
- Martin Rinard, Professor, Massachusetts Institute of Technology, USA, rinard@lcs.mit.edu
- Joseph Sifakis, Professor, Verimag, Grenoble, France, joseph.sifakis@imag.fr
- Marilyn Wolf, Professor, Georgia Institute of Technology, USA, wolf@ece.gatech.edu