



Stefan Kaestle

Senior Member of Technical at Oracle Labs

Research Interests

Exploring the challenges of executing parallel programs on large multicore machines, in particular in regard to memory allocation and synchronization.

Education

- from 2016 **Senior Member of Technical**, *Oracle Labs*, Zurich, Switzerland.
working in the RAPID SDK team
- 2011 – 2016 **PhD student**, *ETH*, Zurich, Switzerland.
Multicore machines are increasingly complex. In order to retain scalability of parallel applications, data has to be distributed and replicated in memory across the machine. Furthermore, concurrently running threads need to synchronize their execution and coordinate when accessing shared data consistently.
My work explores smart machine-aware memory management and synchronization so that programmers do not have to understand complexities of modern multicore hardware.
- 2005 – 2011 **Diploma**, *Karlsruhe Institute of Technology (KIT)*, Karlsruhe Germany.
With focus on:
- Operating systems: including μ -kernels, power management and distributed systems
 - Networks: including High-Speed Networks, Wireless Sensor Networks and Next Generation Internet
- Diploma Thesis: Performance Analysis of File Processing in Mainframe Environments

Awards

- 2011 Master's thesis: 2nd Runner Up, SHARE Academic Award for Excellence

Professional Experience

- Feb. – May 2014 **Internship**, *Oracle Labs*, Cambridge, UK.
Design of a new runtime systems that uses resource usage hints given by application programmers to automatically tune thread and data placement to machine characteristics.
- May '10 – Jan. '11 **Diploma thesis**, *IBM Research and Development*, Böblingen, Germany.
Performance analysis in mainframe environments by profiling operating system components using efficient dynamic code insertion. Dynamic code insertion allows to run a low overhead analysis over long time periods even under high system load.

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- September 2009 **Workshop**, *IBM Research and Development*, Böblingen, Germany.
zSummer University: IBM System z Hardware, Software components for System z.
- Dec. '08 – April '09 **Research Assistant**, *KIT - Institute of Telematics*, Karlsruhe, Germany.
Wireless Sensor Networks: Designed a representation of the CIM network management protocol in Java and a mapping between both models; Applied for managing test-beds for Wireless Sensor Networks.
- Dec. '07 – Oct. '08 **Research Assistant**, *KIT - Institute of Telematics*, Karlsruhe, Germany.
Collaborative Research Center 588 - Humanoid Robots: Design and implementation of a program for automatic mapping of 2D images on 3D meshes.

Publications

Stefan Kaestle, Reto Achermann, Roni Hacki, Moritz Hoffmann, Sabela Ramos, and Timothy Roscoe. Machine-aware atomic broadcast trees for multicores. In *Proceedings of the 12th USENIX Symposium on Operating Systems Design and Implementation*, Savannah, GA, USA, 2016.

Stefan Kaestle, Reto Achermann, Timothy Roscoe, and Tim Harris. Shoal: Smart Allocation and Replication of Memory for Parallel Programs. In *Proceedings of the 2015 USENIX Annual Technical Conference*, USENIX ATC '15, Santa Clara, CA, 2015. USENIX Association. [PDF].

Tim Harris and Stefan Kaestle. Callisto-RTS: Fine-grain parallel loops. In *Proceedings of the 2015 USENIX Annual Technical Conference*, USENIX ATC '15, Santa Clara, CA, 2015. USENIX Association. [PDF].

Pravin Shinde, Antoine Kaufmann, Timothy Roscoe, and Stefan Kaestle. We need to talk about NICs. In *Proceedings of the 14th USENIX Conference on Hot Topics in Operating Systems*, HotOS'13, Berkeley, CA, USA, 2013. USENIX Association. [PDF].

Research Activity

Stefan Kaestle, Timothy Roscoe
Distributed Computing on Hybrid Multicore Machines [POSTER] [TALK]
Doctoral workshop, 8th European Conference on Computer Systems, 2013

Stefan Kaestle, Timothy Roscoe
What does distributed computing look like on a multicore machine? [PDF]
Poster at 10th USENIX Symposium on Operating Systems Design and Implementation, 2012

Skills

Programming Languages C/C++, Linux shell scripting, Python, Assembler (x86/ARM), Java, Haskell
German: Native Proficiency, English: Professional Working Proficiency

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