Gerd Zellweger, Dr. sc. ETH Zurich

Contact Information

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Education

ETH Zürich, Switzerland

Doctor of Sciences ETH Zurich **2013 − 2017**

- Dissertation "On the Construction of Dynamic and Adaptive Operating Systems"
- Advisor: Professor Timothy Roscoe

Master of Science in Computer Science **2009 − 2012**

Bachelor of Science in Computer Science **2006 − 2010**

Professional Experience

VMware, Research Group, Palo Alto, USA

Research Scientist **March 2018 − now**

Exploring operating systems design and implementation, networks and system software interaction with emerging hardware technologies.

ETH Zürich, Zürich, CH

Research Assistant **February 2013 − December 2017**

Doctoral student doing research on how to structure an OS for future multi and many-core systems. Teaching operating systems, networks, parallel- and systems programming to graduate and undergraduate students.

HP Labs, Palo Alto, USA

Research Associate **June 2015 − September 2015**

I worked in the systems research group where I designed, implemented and evaluated extensions to the virtual memory subsystem for a BSD derivative OS, to address problems occurring with huge memory capacities in high-end server systems.
Technologies: C, virtual memory systems

Microsoft Research, Redmond, USA

Research Intern **July 2014 − September 2014**

I collaborated with the Orleans team to work on the Orleans actor system, a distributed runtime for the cloud. I looked specifically at actor placement algorithms and developed new algorithms to improve the actor placement decisions and evaluated them in the cloud.
Technologies: C#, .NET, Azure Cloud, Orleans

sc-n.ch, Zürich, Switzerland

Software Engineer **February 2012 − February 2013**

Consultant working for a large insurance company (Java EE, IBM Websphere, Ant, XML, SOA).

PEER-REVIEWED
PUBLICATIONS

Anton Burtsev, Dan Appel, David Detweiler, Tianjiao Huang, Zhaofeng Li, Vikram Narayanan, Gerd Zellweger. "**Isolation in Rust: What is Missing?**", *Proceedings of the 11th Workshop on Programming Languages and Operating Systems*, Virtual, 2021.

Ankit Bhardwaj, Chinmay Kulkarni, Reto Achermann, Irina Calciu, Sanidhya Kashyap, Ryan Stutsman, Amy Tai, Gerd Zellweger. "**NrOS: Effective Replication and Sharing in an Operating System.**", *Proceedings of the 15th USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, Virtual, 2021.

Vikram Narayanan, Tianjiao Huang, David Detweiler, Dan Appel, Zhaofeng Li, Gerd Zellweger, Anton Burtsev. "**RedLeaf: Isolation and Communication in a Safe Operating System.**", *Proceedings of the 14th USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, Virtual, 2020.

Igor Smolyar, Alex Markuze, Boris Pismenny, Haggai Eran, Gerd Zellweger, Austin Bolen, Liran Liss, Adam Morrison, Dan Tsafrir. "**IOctopus: outsmarting nonuniform DMA.**", *Conference on Architectural support for Programming languages and Operating systems (ASPLOS)*, Lausanne, CH, March 2020 [best paper award].

Gerd Zellweger, Denny Lin, Timothy Roscoe. "**So many performance events, so little time**", *Proceedings of the 7th Asia-Pacific Workshop on Systems (APSys)*, Hong Kong, China, August 2016.

Jana Giceva, Gerd Zellweger, Gustavo Alonso, Timothy Roscoe. "**Customized OS support for data processing**", *Proceedings of the 12th International Workshop on Data Management on New Hardware (DaMoN)*, San Francisco, USA, June 2016.

Jana Giceva, Gerd Zellweger, Gustavo Alonso, Timothy Roscoe. "**Basslet: an OS runtime for parallel data processing**", *Workshop on Multicore and Rack-scale Systems (MaRS)*, London, UK, April 2016 [extended abstract & talk].

Izzat El Hajj, Alexander Merritt, Gerd Zellweger, Dejan Milojicic, Reto Achermann, Paolo Faraboschi, Wen-mei Hwu, Timothy Roscoe, Karsten Schwan. "**SpaceJMP: Programming with Multiple Virtual Address Spaces**", *Proceedings of the 21th international conference on Architectural support for Programming languages and Operating systems (ASPLOS)*, Atlanta (GA), USA, April 2016 [HiPEAC paper award].

Simon Gerber, Gerd Zellweger, Reto Achermann, Kornilios Kourtis, Timothy Roscoe, Dejan Milojicic. "**Not Your Parents' Physical Address Space**", *Proceedings of the 15th Workshop on Hot Topics in Operating Systems (HotOS)*, Kartause Ittingen, May 2015.

Gerd Zellweger, Simon Gerber, Kornilios Kourtis, Timothy Roscoe. "**Decoupling Cores, Kernels, and Operating Systems**", *Proceedings of the 11th USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, Broomfield, USA, October 2014.

Gerd Zellweger, Adrian Schüpbach, Timothy Roscoe. "**Unifying synchronization and events in a multicore OS**", *Proceedings of the 3rd Asia-Pacific Workshop on Systems (APSys)*, Seoul, South Korea, July 2012.

PATENTS	Gerd Zellweger, Lalith Suresh, Jayneel Gandhi, Amy Tai. **Efficiently managing the interruption of user-level critical sections**, granted, US10922128B1.

Gerd Zellweger, Lalith Suresh, Jayneel Gandhi, Amy Tai. **Efficiently managing the interruption of user-level critical sections**, granted, US10922128B1.

Gerd Zellweger, Stanko Novakovic. **Decentralized sparse capability system with secure enclaves**, granted, US11089022B2.

Izzat El Hajj, Alexander Marshall Merritt, Gerd Zellweger, Dejan S. Milojicic, Paolo Faraboschi. **Independent shared and process virtual address translations**, granted, US10592431B2.

Izzat El Hajj, Alexander Merritt, Gerd Zellweger, Dejan Milojicic. **Persistent virtual address spaces**, granted, US10754792B2.

Izzat El Hajj, Alexander Merritt, Gerd Zellweger, Dejan Milojicic. **Versioning virtual address spaces**, pending, WO2017131779A1.

Izzat El Hajj, Alexander Merritt, Gerd Zellweger, Dejan Milojicic. **Identifying object modifications**, pending, WO2017131780A1.

Izzat El Hajj, Alexander Merritt, Gerd Zellweger, Dejan S Milojicic. **Server virtual address space**, pending, US20190095242A1.

Izzat El Hajj, Alexander Merritt, Gerd Zellweger, Dejan Milojicic, Reto Achermann. **Memory management with versioning of objects**, pending, WO2017131789A1.

Izzat El Hajj, Alexander Merritt, Gerd Zellweger, Dejan Milojicic. **Switch process virtual address space**, pending, WO2017044124A1.

PROJECTS

TEXercises

I was a co-founder of Texercises, a company that provides a collaborative online exercise database for all kinds of classes in science of nature and allows simple and quick generation of exercise sheets for teachers and students. I was responsible for the technical development of the product. Texercises was acquired by edTechLab AG in 2015.
Technologies: Python, Django, SQL, JavaScript, LaTeX, HTML

Barrelfish OS
www.barrelfish.org

The Barrelfish operating system is exploring how to structure an OS for future multi- and many- core systems motivated by the increasing amount of cores and diversity in computer hardware. I have contributed code to most areas of the system during my studies at ETH and I have written some of the core services and a few device drivers in the OS from scratch.
Technologies: C, Python, Haskell, x86, ARM

Open Source Software
www.github.com/gz

I enjoy collaborating on open source projects. I am the creator and maintainer of several open source libraries and programs, mainly written in Rust and Python.

TEACHING

I have been a teaching assistant at ETH for Systems Programming and Computer Architecture (2014, 2015, 2016), Parallel Programming (2014, 2015), Advanced Operating Systems (2014) and Computer Science for Biology and Pharmaceutical Sciences (2013). My duties involved weekly tutoring sessions with up to 30 students, devising and grading weekly exercises, midterm and end-term exams.

INVITED TALKS & WORKSHOPS	July 2021: **UBC Systopia Seminar** *"NrOS: Effective Replication and Sharing in an Operating System"*
	April 2021: **EPFL Scalable Software Seminar** *"NrOS: Effective Replication and Sharing in an Operating System"*
	March 2021: **DevPulseCon 2021** *"Workshop on Rust Programming"*
	October 2020: **DevPulseCon 2020** *"Workshop on Rust Programming"*
	April 2017: **VMware Research** invited talk on *"Implications of New and Future Hardware for Operating Systems"*
	April 2017: **Apple CoreOS** invited talk on *"Implications of New and Future Hardware for Operating Systems"*
	April 2017: **HPE Labs** invited talk on *"Implications of New and Future Hardware for Operating Systems"*
	March 2017: **Microsoft Research** invited talk on *"Implications of New and Future Hardware for Operating Systems"*
	March 2017: **Huawei Research** invited talk on *"Implications of New and Future Hardware for Operating Systems"*
	January 2017: **ETH Zurich**, Industry Retreat talk on *"The Paradox of Choice in Multicore Performance Monitoring"*
	April 2016: **ASPLOS conference** Lightning talk on *"SpaceJMP"*
	January 2016: **ETH Zurich**, Industry Retreat talk on *"SpaceJMP"*
	November 2015: **ETH Zurich**, Department Evaluation on *"Decoupling Cores Kernels and Operating Systems"*
	October 2015: **NewOS Workshop**: On *"Applications for HPC, IoT and non-volatile memory"*
	September 2015: **ETH Zurich**, Lunch Seminar on *"Multiple virtual address spaces"*
	August 2015: **HP Labs** invited talk on *"Multiple virtual address spaces"*
	January 2015: **ETH Zurich**, Industry Retreat talk on *"Decoupling Cores Kernels and Operating Systems"*
	November 2014: **OSDI Conference** talk on *"Decoupling Cores Kernels and Operating Systems"*
	September 2014: **ETH Zurich**, Seminar talk on *"Decoupling Cores Kernels and Operating Systems"*
	March 2013: **ETH Zurich**, Seminar talk on *"Device Management in a Multicore OS"*
SERVICE	**Sponsor Co-Chair** EuroSys'23
	PC OSDI'22
	PC ASPLOS'22
	PC SC'21 PEHC Workshop
	PC USENIX ATC 2021
	PC IEEE Transactions on Cloud Computing 2020
	PC IEEE Transactions on Cloud Computing 2019
	PC IC2E 2019
	PC Middleware 2019
	Submissions Co-Chair ATC 2019
LANGUAGES	• German: Native language
	• English: Fluent in reading and writing
	• French: Basic knowledge
REFERENCES	*Available on request.*