Laurent **Bindschaedler**

Research Group Leader at the Max Planck Institute for Software Systems · MPI-SWS

Room 409, MPI-SWS, Campus E 1 5, 66123 Saarbrücken, Germany

(+49) 681 93039110 | bindsch@mpi-sws.org | Google Scholar: dt14rAQAAAAJ | OrcID: 0000-0003-0559-631X

Research Interests

Systems for Big Data, Graph Processing, and Machine Learning. Machine Learning for Systems. Distributed Systems. Storage Technologies. Databases. Cloud Computing.

Education

EPFL (Ecole Polytechnique Fédérale de Lausanne)

Lausanne, Switzerland

Ph.D. in Computer Science — *Sep. 2015 – Sep. 2020*

- Ph.D. Thesis: An Architecture for Load Balance in Computer Cluster Applications. Supervised by Prof. Willy Zwaenepoel.
- 30 ECTS credits. Depth area: Systems.
- Classes: Principles of Computer Systems (CS-522), Applied Data Analysis (CS-401), Natural Language Processing (CS-431).

EPFL (Ecole Polytechnique Fédérale de Lausanne)

Lausanne, Switzerland

M.S. in Computer Science — *Sep. 2009 – Jun. 2011*

- GPA: 5.54 (out of 6). 125 ECTS credits.
- M.S. Thesis: Track Me If You Can. Hosted by: Nokia Research Center. Supervised by Prof. Jean-Pierre Hubaux.

EPFL (Ecole Polytechnique Fédérale de Lausanne)

Lausanne, Switzerland

B.S. in Computer Science — *Sep. 2006 – Jun. 2009*

- GPA: 5.59 (out of 6). 189 ECTS credits.
- B.S. Thesis: Secure SMS. Supervised by Prof. Jean-Pierre Hubaux.

Employment History

MPI-SWS (Max Planck Institute for Software Systems)

Saarbrücken, Germany

Research Group Leader — *Nov. 2022 –*

- Data Systems Group (DSG).
- Current group: 3 graduate students, 2 MS students, 4 interns.
- Main projects: HAL–Systems for Complex AI, SkyPulse–Satellite Data Augmentation, AlterEgo–Blockchain Analytics, Triskelion–Scalable Graph Neural Networks, and Vortex–Graph Store for Large-Scale Real-Time Anomaly Detection.

MIT (Massachusetts Institute of Technology)

Cambridge, MA, USA

Postdoctoral Fellow — *Sep. 2020 – Nov. 2022*

- Data Systems Group (DSG), Computer Systems and AI Lab (CSAIL). Prof. Tim Kraska.
- Projects: Real-Time Graph Pattern Mining, Benchmarking Learned Data Management Systems, Synthesizing Graph Database from Production Logs.

EPFL (Ecole Polytechnique Fédérale de Lausanne)

Lausanne, Switzerland

Doctoral Assistant — *Sep. 2015 – Sep. 2020*

- Ph.D. Candidate in the Operating Systems Laboratory (LABOS), IC. Supervised by Prof. Willy Zwaenepoel.
- IT administrator for the laboratory (since 2018), in charge of support, maintenance, and purchases.

EPFL (Ecole Polytechnique Fédérale de Lausanne)

Lausanne, Switzerland

Research Assistant — *Mar. 2014 – Aug. 2015*

- Operating Systems Laboratory (LABOS), IC. Prof. Willy Zwaenepoel.
- Technical coordinator for the Data Center Observatory, a small state-of-the-art data center for researchers at EPFL, ETHZ, and USI.
- Designer of Chaos, a graph processing system that enables analytics on very large graphs using secondary storage.
- Developer and Maintainer of X-Stream, a single-machine graph processing system based on streaming partitions.

Lobnek Wealth Management

Geneva, Switzerland

IT Consultant – Acting Head of IT

Jul. 2013 – Feb. 2014

- Oversaw the modernization of the IT infrastructure, including the design and development of new interactive analytics for customers.
- Implemented data integration and daily transactions reconciliation from different custodians into internal systems.

LakeMind

Lausanne, Switzerland

Co-Founder and VP of Engineering

Aug. 2011 – Jun. 2013

- LakeMind makes cloud services more reliable by automatically troubleshooting and repairing service outages. As a result, the duration of service downtimes is drastically reduced and developers spend less time fixing problems.
- LakeMind was an incubating company at EPFL in LABOS and NAL, supported by an Innovation Grant and Venture Kick.
- I designed and implemented the software stack for LakeMind consisting of an event processing pipeline, distributed in-memory dependency graph data structures, and several signal processing and machine learning algorithms. My responsibilities also involved coordinating the software development efforts involving several interns and business development in Europe and the US.
- Cloud service troubleshooting was too early to gain traction in its market segment and we did not attract the venture capital required to develop a minimum viable product. Recently, this market segment has seen significant activity.
- The two co-founders retain full ownership of the Intellectual Property and software developed.

Nokia Research Center

Lausanne, Switzerland

Intern

Jan. 2011 – Jul. 2011

- Designed and implemented the prototype for a location privacy-preserving service for smartphones, which was a key component in the Nokia-EPFL NIC Trial that took place in 2011 and involved ~ 100 participants for 4 months.
- Demonstrated and published practical attacks on context-based identifier changes in such mobile networks.

Swiss Armed Forces

Morges, Switzerland

IT Pioneer — Chief of Staff, 1st Army Region

Jul. 2006 – Dec. 2018

Publications

[RE4Web3 '25] A Computational Decision Support Workflow for Requirement Engineering in DAOs. [PDF]
Peer-reviewed International Workshop.
Quentin Botha, **Laurent Bindschaedler**, Christoph Siebenbrunner.

[RE4Web3 '25] A Requirements Analysis for a Decentralized Mathematics Prediction Market. [PDF]
Peer-reviewed International Workshop.
Quentin Botha, **Laurent Bindschaedler**, Christoph Siebenbrunner.

[GRADES-NDA '25] Everything You Wanted to Know About Graph Neural Network Partitioning (But Were Afraid to Ask). [PDF]
Peer-reviewed International Workshop.
Chongyang Xu, **Laurent Bindschaedler**.

[HPDC '25] F3: An FPGA-accelerated FaaS Framework. [PDF]
Peer-reviewed International Conference.
Charalampos Mainas, Martin Lambeck, Bruno Scheufler, **Laurent Bindschaedler**, Atsushi Koshiba, and Pramod Bhatotia.

[DL4C '25] LoRACode: LoRA Adapters for Code Embeddings. [PDF]
Peer-reviewed International Workshop.
Saumya Chaturvedi, Aman Chadha, **Laurent Bindschaedler**.

[EuroMLSys '25] May the Memory Be With You: Efficient and Infinitely Updatable State for Large Language Models. [PDF]
Peer-reviewed International Workshop.
Excel Chukwu, **Laurent Bindschaedler**.

[DOLAP '25] The Case for Instance-Optimized LLMs in OLAP Databases. [PDF]
Peer-reviewed International Workshop.
Bardia Mohammadi, **Laurent Bindschaedler**.

[WSDM '25] Towards Reliable Latent Knowledge Estimation in LLMs: Zero-Prompt Many-Shot Based Factual Knowledge Extraction. [PDF]
Peer-reviewed International Conference.
Qinyuan Wu, Mohammad Aflah Khan, Soumi Das, Vedant Nanda, Bishwamittra Ghosh, Camila Kolling, Till Speicher, **Laurent Bindschaedler**, Krishna Gummadi, Evimaria Terzi.

[EdgeSys ’24] AlterEgo: A Dedicated Blockchain Node For Analytics. [PDF]
Peer-reviewed International Workshop.
Qi Guo, Mahdi Alizadeh, Ali Falahati, **Laurent Bindschaedler**.

[ICDE ’23] Unshackling Database Benchmarking from Synthetic Workloads. [PDF]
Peer-reviewed International Workshop.
Parimarjan Negi*, **Laurent Bindschaedler***, Mohammad Alizadeh, Tim Kraska, Jyoti Leeka, Anja Gruenheid, Matteo Interlandi.

[CompAuto ’22] Accurate Automatic Camera Calibration on Low-Quality CCTV Traffic Video Streams. [PDF]
Peer-reviewed International Conference.
Audhav Durai, Sankarshanaram Vempati, **Laurent Bindschaedler**.

[EuroSys ’21] Tesseract Distributed, General Graph Pattern Mining on Evolving Graphs.* [PDF]
Peer-reviewed International Conference (acceptance rate 21%).
Laurent Bindschaedler, Jasmina Malicevic, Baptiste Lepers, Ashvin Goel, and Willy Zwaenepoel.

[SMDB ’21] Towards a Benchmark for Learned Systems.* [PDF]
Peer-reviewed International Conference.
Laurent Bindschaedler, Andreas Kipf, Tim Kraska, Ryan Marcus, and Umar Farooq Minhas.

[THESIS] An Architecture for Load Balance in Computer Cluster Applications. [PDF]
Doctoral Disseration, EPFL, 2020. **Laurent Bindschaedler**.
Ph.D. Committee: Alain Wegmann, Edouard Bugnion, Dushyanth Narayanan, Ashvin Goel, and Willy Zwaenepoel.

[ASPLOS ’20] Hailstorm: Disaggregated Compute and Storage for Distributed LSM-based Databases.* [PDF]
Peer-reviewed International Conference (acceptance rate 18%). **Best Presentation Award**.
Laurent Bindschaedler, Ashvin Goel, and Willy Zwaenepoel.

[EuroSys ’18] Rock You like a Hurricane: Taming Skew in Large Scale Analytics.* [PDF]
Peer-reviewed International Conference (acceptance rate 16%).
Laurent Bindschaedler, Jasmina Malicevic, Nicolas Schiper, Ashvin Goel, and Willy Zwaenepoel.

[SOSP ’15] Chaos: Scale-out Graph Processing from Secondary Storage.* [PDF]
Peer-reviewed International Conference (acceptance rate 17%).
Amitabha Roy, **Laurent Bindschaedler**, Jasmina Malicevic, and Willy Zwaenepoel.

[REPORT] Benchmarking X-Stream and Graphchi. [PDF]
Technical Report. EPFL. 2014
Laurent Bindschaedler, and Amitabha Roy.

[PerCom ’12] Big Brother Knows Your Friends: on Privacy of Social Communities in Pervasive Network. [PDF]
Peer-reviewed International Conference.
Igor Bilogrevic, Murtuza Jadliwala, Istvan Lam, Imad Aad, Philip Ginzboorg, Valtteri Niemi, **Laurent Bindschaedler**, and Jean-Pierre Hubaux.

[NDSS ’12] Track Me If You Can: On the Effectiveness of Context-based Identifier Changes in Deployed Mobile Networks. [PDF]
Peer-reviewed International Conference (acceptance rate 18%).
Laurent Bindschaedler, Murtuza Jadliwala, Igor Bilogrevic, Imad Aad, Philip Ginzboorg, Valtteri Niemi, and Jean-Pierre Hubaux.

[MobileHCI ’11] Making Mobile Augmented Reality A Reality. [PDF]
Peer-reviewed International Conference.
Laurent Bindschaedler, Hendrik Knoche, and Jeffrey Huang.

Supervision of Students

Graduate Students

Chongyang Xu

Jinhao Hu

Bardia Mohammadi

Affiliated Graduate Students

Qi Guo

Interns

Bardia Mohammadi — Systems for Complex AI Models. *Summer 2024*

Emmilly Immaculate Namuganga — Adversarial Benchmarking for Learned Systems. *Summer 2024*

Excel Chukwu — Updatable LLMs. *Summer 2024*

Bhumika Mittal — Efficient Transactional Graph Storage. *Summer 2024*

Pranay Borgohain — Scaling LLM Context Size. *Summer 2024*

Saumya Chaturvedi — System for Multi-LoRA Adapter Selection. *Summer 2024*

Attreyee Mukherjee — Batching and Cascading for Complex AI Models. *Summer 2024*

Leshna Balara — Efficient Concurrently Updateable Learned Index. *Spring 2024*

Abhinit Mahajan — Ghost Data: Synthesizing Databases From Anonymized Query Logs. *Spring 2024*

Mihir Trivedi — Data Ingestion for Satellite Data Analysis. *2023-2024*

Harsh Parikh — Data Ingestion for Satellite Data Analysis. *2023-2024*

Ali Falahati — AlterEgo: A Dedicated Blockchain Node For Analytics. *Summer 2023*

Mahdi Alizadeh — AlterEgo: A Dedicated Blockchain Node For Analytics. *Summer 2023*

Giorgos Kosmas — Efficient Concurrently Updateable Learned Index. *Summer 2023*

Hardik Katehara — Efficient Transactional Graph Storage. *Summer 2023*

Master Thesis

Parul Negi — Critical Infrastructure Monitoring Using Multi-Modal Satellite Data Augmentation. *Fall 2024*

Julian Klein — Efficient Transactional Graph Storage. *Fall 2024*

Master Semester Projects

Mario Bucev — Graph Ingestion Engine for Evolving Graphs. *Spring 2019*

Diego Antognini — Scalable Decentralized Storage System Design. *Spring 2016*

Vlad Haprian — Load Balancing Techniques for Chaos. *Spring 2016*

Summer Internship Project

Junyao Zhao — HDFS Support for X-Stream. *Summer 2015*

Teaching Activities

MPI & UdS, Operating Systems (OS2024) *Saarbrücken, Germany*

Lecturer *Spring 2024*

- Undergraduate level, ~ 50 students. Taught in English.
- Co-instructor for the class.

MPI & UdS, Systems for Large Language Models (SysLLM2024) *Saarbrücken, Germany*

Lecturer *Spring 2023*

- Seminar, 12 students. Taught in English.
- Co-instructor for the seminar.

MPI & UdS, Distributed Systems (DS2023) *Saarbrücken, Germany*

Lecturer *Spring 2023*

- Undergraduate level, ~ 50 students. Taught in English.
- Co-instructor for the class.

EPFL, Real-time Systems (CS-321) *Lausanne, Switzerland*

Guest Lecturer *Fall 2019*

- Undergraduate level, ~ 50 students. Taught in French.
- Gave a 1-hour lecture on ContikiOS and protothreads.

EPFL, Operating Systems Introduction (CS-323)

Lausanne, Switzerland

Guest Lecturer

Spring 2018, Spring 2019

- Undergraduate level, ~ 100 students. Taught in English.
- Gave a 2-hour lecture on Virtual Machines.

EPFL, Real-time Systems (CS-321)

Lausanne, Switzerland

Teaching Assistant

Fall 2019

- Undergraduate level, ~ 50 students. Taught in French.
- Head Teaching Assistant.
- Designed and led lab sessions.

EPFL, Operating Systems Introduction and Implementation (CS-323 & CS-323a)

Lausanne, Switzerland

Teaching Assistant

Spring 2017, Spring 2018, Spring 2019

- Undergraduate level, ~ 100 students in Introduction class, ~ 30 students in Implementation class. Taught in English.
- Part of a team of 4 Ph.D. Teaching Assistants.
- Led exercise and answers sessions, graded exams, and held office hours in the Introduction class.
- Designed and graded 4 mini-projects in the Implementation class.

EPFL, Calculus III (MATH-203)

Lausanne, Switzerland

Teaching Assistant

Fall 2018

- Undergraduate level, ~ 300 students. Taught in French.
- Part of a team of 4 Ph.D. Teaching Assistants coordinating ~ 20 undergraduate TAs.
- Led exercise and answers sessions, graded exams, and held office hours.

EPFL, Information, Computation, Communication (CS-119)

Lausanne, Switzerland

Teaching Assistant

Fall 2016, Fall 2017

- Undergraduate level, ~ 200 students. Taught in French.
- Part of a team of 4 Ph.D. Teaching Assistants coordinating ~ 20 undergraduate TAs.
- Designed and graded exams, led exercise and answers sessions, held office hours.

EPFL, System Oriented Programming (CS-207)

Lausanne, Switzerland

Teaching Assistant

Spring 2016

- Undergraduate level, ~ 150 students. Taught in French.
- Head Teaching Assistant coordinating 8 undergraduate TAs.
- Designed and graded exercises, projects, and exams.

EPFL, Various Undergraduate Classes

Lausanne, Switzerland

Student Teaching Assistant

Fall 2009 - Spring 2011

- Information Technology (French), Systems Programming (English), and Software Engineering (English).

Professional Service

Jun. 2025	**Program Committee,** USENIX Symposium on Operating Systems Design and Implementation (OSDI)	*Boston MA, USA*
Mar. 2025	**Program Committee,** ACM European Conference on Computer Systems (EuroSys)	*Rotherdam, The Netherlands*
Mar. 2025	**Program Committee (External),** Architectural Support for Programming Languages and Operating Systems (ASPLOS)	*Rotherdam, The Netherlands*
Mar. 2025	**Program Committee,** International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP)	*Barcelona, Spain*
Dec. 2024	**Program Committee (External),** ACM/IFIP International Middleware Conference (Middleware)	*Hong Kong, China*
Nov. 2024	**Program Committee,** ACM Symposium on Operating Systems Principles (SOSP)	*Austin TX, USA*
Jun. 2024	**Program Committee,** USENIX Symposium on Operating Systems Design and Implementation (OSDI)	*Santa Clara CA, USA*
Apr. 2024	**Program Committee,** Architectural Support for Programming Languages and Operating Systems (ASPLOS)	*San Diego CA, USA*
Apr. 2024	**Program Committee,** Workshop on Machine Learning and Systems (EuroMLSys)	*Athens, Greece*
Apr. 2024	**Program Committee,** ACM European Conference on Computer Systems (EuroSys)	*Athens, Greece*
Mar. 2024	**Program Committee,** International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP)	*Paestum, Italy*
Jan. 2024	**Reviewer,** The VLDB Journal	*(Journal)*
Dec. 2023	**Program Committee,** ACM/IFIP International Middleware Conference (Middleware)	*Bologna, Italy*
Oct. 2023	**Web & Publicity Chair,** ACM Symposium on Operating Systems Principles (SOSP)	*Koblenz, Germany*
Jul. 2023	**Program Committee (Heavy),** USENIX Annual Technical Conference (ATC)	*Boston, MA, USA*
May. 2023	**Program Committee,** ACM International Workshop on Edge systems, Analytics and Networking (EdgeSys)	*Rome, Italy*
Mar. 2023	**Program Committee,** Architectural Support for Programming Languages and Operating Systems (ASPLOS)	*Vancouver, Canada*
Feb. 2023	**Evaluator,** FRQNT - Comité d'évaluation Programme Établissement de la relève professorale	*Quebec, Canada*
Apr. 2022	**Program Committee,** Workshop on Machine Learning and Systems (EuroMLSys)	*Rennes, France*
Jul. 2022	**Program Committee (Heavy),** USENIX Annual Technical Conference (ATC)	*Carlsbad, CA, USA*
Nov. 2021	**Program Committee,** International Workshop on AI in Networks and Distributed Systems (WAIN)	*Milan, Italy*
Jul. 2021	**External Reviewer,** USENIX Symposium on Operating Systems Design and Implementation (OSDI)	*Santa Clara, CA, USA*
Jul. 2021	**Program Committee,** USENIX Annual Technical Conference (ATC)	*Santa Clara, CA, USA*
Jun. 2021	**Program Committee,** ACM SYSTOR	*Haifa, Israel*
Apr. 2021	**Program Committee,** Workshop on Machine Learning and Systems (EuroMLSys)	*Edinburgh, UK*
Sep. 2020	**Reviewer,** ACM Transactions on Computer Systems (TOCS)	*(Journal)*
Jul. 2020	**External Reviewer,** USENIX Annual Technical Conference (ATC)	*Boston, MA, USA*
Apr. 2020	**Organizer and PC Chair,** 1st European Workshop on Graph Processing Systems (EuroGraph)	*Heraklion, Greece*
Feb. 2018	**External Reviewer,** ACM Principles and Practice of Parallel Programming (PPoPP)	*Vienna, Austria*

Prizes, Awards, Fellowships

May. 2025 **Associate Fellow,** University of Saarland

May. 2020 **Early Postdoc.Mobility Fellowship: P2ELP2_195136,** Swiss National Science Foundation

Mar. 2020 **Best Presentation Award,** ASPLOS'20

Dec. 2017 **Teaching Assistant Award,** EPFL IC Faculty

Dec. 2017 **Public Prize Winner,** Exposure Science Movie Hackathon

Sep. 2015 **Ph.D. Fellowship,** EPFL EDIC

Jan. 2012 **Venture Kick 1st Round,** LakeMind

Talks

Nov. 2024	**Virtualization and Virtual Machines,** Guest Lecture	*HES-SO*
Nov. 2024	**AlterEgo,** A Dedicated Blockchain Node for Analytics	*Saar Blockchain Meetup*
Oct. 2024	**Byzantine Fault Tolerance for Instant Payments,**	*Saar Blockchain Meetup*
Nov. 2023	**Virtualization and Virtual Machines,** Guest Lecture	*HES-SO*
Sep. 2023	**When AI Works and Workers Adapt,**	*SECO Annual Meeting*
May. 2023	**Introduction to Learned Index,**	*MPI Lightning Talk*
Mar. 2023	**Machine Learning (m)eats Software,**	*BWInf 2023*
Oct. 2022	**Designing Scalable, Interactive, and Autonomous Big Data Systems,**	*Aalborg University*
Apr. 2022	**Designing Scalable, Interactive, and Autonomous Big Data Systems,**	*NTNU*
Mar. 2022	**Designing Scalable, Interactive, and Autonomous Big Data Systems,**	*Imperial College*
Mar. 2022	**Designing Scalable, Interactive, and Autonomous Big Data Systems,**	*U. Amsterdam*
Mar. 2022	**Designing Scalable, Interactive, and Autonomous Big Data Systems,**	*Rochester University*
Mar. 2022	**Designing Scalable, Interactive, and Autonomous Big Data Systems,**	*TU Münich*
Mar. 2022	**Designing Scalable, Interactive, and Autonomous Big Data Systems,**	*U. Reykjavik*
Feb. 2022	**Designing Scalable, Interactive, and Autonomous Big Data Systems,**	*U. Radboud*
Feb. 2022	**Designing Scalable, Interactive, and Autonomous Big Data Systems,**	*U. Saarland & MPI-SWS*
May. 2021	**LOKI,** Towards a Benchmark for Learned Systems	*SMDB'21*
Jun. 2021	**Tesseract,** Fast, Scalable Graph Pattern Mining on Evolving Graphs	*U. Sydney*
Apr. 2021	**Tesseract,** Fast, Scalable Graph Pattern Mining on Evolving Graphs	*EuroSys'21*
Mar. 2020	**Hailstorm,** Disaggregated Compute and Storage for Distributed LSM-based Databases	*ASPLOS'20*
Oct. 2019	**Tesseract,** Fast, Scalable Graph Pattern Mining on Evolving Graphs	*U. Toronto*
May. 2019	**Tesseract,** Fast, Scalable Graph Pattern Mining on Evolving Graphs	*EcoCloud'19*
Jun. 2018	**Rock You Like a Hurricane,** Taming Skew in Large Scale Analytics	*EcoCloud'18*
Apr. 2018	**Rock You Like a Hurricane,** Taming Skew in Large Scale Analytics	*EuroSys'18*
Oct. 2015	**Chaos,** Scale-out Graph Processing from Secondary Storage	*SOSP'15*
Jul. 2012	**LakeMind,** Making Cloud Service More Reliable	*VentureKick'12*
Jan. 2012	**Track Me If You Can,** on the Effectiveness of Context-based Identifier Changes in Mobile Networks	*NDSS'12*
Sep. 2011	**ARLO,** Making Mobile Augmented Reality a Reality	*MobileHCI'11*

Language Skills

French	**Fluent,** Mother tongue
English	**Fluent (C2),** Cambridge Certificate of Proficiency
German	**Basic Knowledge (B2),** Zertifikat Deutsch

Personal Skills / Hobbies

Improvisional Theatre

Founding Member of l'Improsture, an improv team active in French-speaking Switzerland

Chess

Junior chess player in the Geneva chess club. ELO-rated. Hobbyist to this day.

Piano

Classical and pop player.