



Rafael Pereira Pires

09.07.2026

Languages

English	advanced (C2)
French	advanced (C1)
German	intermediate (B1)
Portuguese	native speaker

Education

- 2016–2019 **PhD in Computer Science**, *University of Neuchâtel*, Neuchâtel, Switzerland
Topic: distributed systems and trusted execution environments.
Areas: stream processing, confidential MapReduce, security, privacy, cryptography.
Léon du Pasquier et Louis Perrier award, for an excellent PhD thesis. Issued by the Faculty of Sciences of the University of Neuchâtel.
- 2012–2014 **Professional master in Mechatronics**, *Federal Institute of Santa Catarina*, Florianópolis, Brazil
Topic: trajectory control in a welding manipulator.
Areas: kinematics, low level communication protocols, welding procedures.
- 2006–2009 **Master in Computer Science**, *Federal University of Santa Catarina*, Florianópolis, Brazil
Topic: routing in wireless ad-hoc networks.
Areas: embedded operating systems, distributed systems.
- 2002–2006 **Bachelor in Computer Science**, *Federal University of Santa Maria*, Santa Maria, Brazil
Project topic: disconnected operation in mobile devices.
Areas: ubiquitous computing, context-aware applications.
Distinguished student award, for academic excellence. Issued by the Brazilian computer society.

Academic experience

- 2024–today **Lecturer in the School of Computer and Communication Sciences,**
EPFL, Lausanne, Switzerland
- Supervision spring 2025: 2 bachelor semester projects + 1 master semester project.
- 2020–today **Postdoc in the Scalable computing systems laboratory,**
EPFL, Lausanne, Switzerland
- Lab head: Prof. Anne-Marie Kermarrec
 - Research in large-scale systems, mostly in decentralized and federated learning contexts. Particularly, from systems efficiency and data privacy perspectives.
 - Mentoring: 4 PhD students, 3 Master thesis, 9 Master semester projects, 6 Bachelor semester projects, 3 internships.
 - **Premium as recognition for outstanding performance in the year 2021/22.** Granted by the human resources department at EPFL, after supervisor's nomination.
- 2016–2019 **PhD student in the Complex systems and Big Data competence centre,**
University of Neuchâtel, Neuchâtel, Switzerland
- Supervisor: Prof. Pascal Felber, Co-supervisor: Prof. Marcelo Pasin
 - R&D Project: SecureCloud, about confidential computing in the cloud.
 - Mentoring: 2 Master thesis
- 2012–2014 **Master student in the Special automatic machines group,**
Federal Institute of Santa Catarina, Florianópolis, Brazil
- Supervisor: Prof. Nelso Bonacorso
 - R&D Project: Welding manipulator robot.
- 2008–2009 **Student internship, Fachhochschule Kiel, Kiel, Germany**
- Supervisor: Prof. Helmut Dispert
 - Attendance of lectures in the International Master's program in Information Technology
 - R&D Project: Communication protocols over IEEE 802.15.4 for a wireless sensor network deployed in aquaculture tanks.
- 2006–2009 **Master student in the Laboratory for software/hardware integration,**
Federal University of Santa Catarina, Florianópolis, Brazil
- Supervisor: Prof. Antônio Augusto Fröhlich
 - R&D Projects:
 - Platform for embedded operating systems
 - Data sampling and wireless transmission of measurements in underground power chambers
- 2002–2006 **Undergraduate in the Mobile computing systems group,**
Federal University of Santa Maria, Santa Maria, Brazil
- Supervisor: Prof. Iara Augustin
 - R&D Projects:
 - Middleware for the development of context-aware applications
 - Pervasive auction portal

Teaching Record

- 2024–today **EPFL, Lausanne - Switzerland,**
Tasks: Lecturer in charge
- 2026 Fall - CS-119(c) Information, Computation, Communication
 - 2026 Spring - COM-112(a) Project-oriented programming
 - 2026 Spring - CS-119(k) Information, Computation, Communication
 - 2025 Fall - CS-119(g) Information, Computation, Communication
 - 2025 Spring - CS-119(k) Information, Computation, Communication
 - 2024 Fall - CS-107 Introduction to Programming (Co-taught with Dr. MER Jamila Sam)

2020–2024 **EPFL, Lausanne - Switzerland,**

Tasks: Occasional substitute lecturer, course management (e.g., leading TAs, hiring and leading student assistants, cluster management for exercises and project, organizing exam sessions)

- 2024 Spring - CS-460 Systems for data management and data science
- 2023 Spring - CS-460 Systems for data management and data science
- 2022 Spring - CS-449 Systems for data science
- 2021 Spring - CS-449 Systems for data science

2016–2019 **Université de Neuchâtel, Neuchâtel - Switzerland,**

Tasks: Teaching assistant (e.g., giving tutorials, conducting lab sessions, designing and grading assignments and project)

- 2019 Spring - Data structures and algorithms
- 2018 Fall - General computer science: Programming I
- 2018 Spring - E-government frameworks
- 2017 Fall - General computer science: Programming I
- 2017 Spring - R&D Workshop
- 2016 Fall - General computer science: Programming I

2006–2008 **UFSC - Federal University of Santa Catarina, Florianópolis - Brazil,**

Tasks: Teaching assistant (e.g., giving tutorials, conducting lab sessions, designing and grading assignments and project)

- 2008 - Software/Hardware integration
- 2007 - Microprocessors laboratory
- 2006 - Operating systems II

2004 **UFSM - Federal University of Santa Maria, Santa Maria - Brazil,**

Tasks: Student assistant (e.g., assisting students in lab sessions, grading assignments)

- 2004 - Data structures

Service

- **2027:** EuroSys'27 (General co-chair)
- **2026:** NeurIPS'26 (PC), Middleware'26 (PC), DSN'26 (PC), BRAINS'26 (PC), ACL Rolling Review (Reciprocal reviewer), IEEE Open Journal of the Computer Society (ad-hoc review), IEEE Trans. on Mobile Computing (ad-hoc review), IEEE Trans. on Information Forensics and Security (ad-hoc review)
- **2025:** DICG@ICDCS'25 (PC), IEEE Trans. on Dependable and Secure Computing (ad-hoc review), IEEE Open Journal of the Communications Society (ad-hoc review)
- **2024:** METIS'24 (Keynote speaker), NETYS'24 (PC), Middleware'24 (External reviewer), IEEE Trans. on Dependable and Secure Computing (ad-hoc review), EuroDW'24 (PC), IEEE Trans. on Information Forensics and Security (ad-hoc review), SBSeg (PC), WTICG@SBRC (PC)
- **2023:** SRDS'23 (PC), EuroSys'23 (Submission chair), DICG@Middleware (PC), WTICG@SBSeg (PC).
- **2022:** EuroSys'22 (Submission chair), DICG@Middleware'22 (PC), SF@SBSeg'22 (PC).
- **2021:** IEEE Internet Computing.
- **Assistant reviewer:** PODC'16, SRDS'16, DSN'18, Middleware'18, PPOPP'19, EuroSys'19, ATC'19, DSN'19, SRDS'19, Middleware'19, ASPLOS'19, DSN'20, OSDI'20, Middleware'20, PODC'21, EuroSys'21, DSN'23, EuroSys'24.

Industry experience

- 2011–2016 **Analyst in Information Technology**, *Public prosecutor's office*, Florianópolis, Brazil
Analysis of data, equipment and procedures related to Information Technology. Computer and mobile forensics.
- 2010–2012 **Systems analyst**, *Automatisa*, Florianópolis, Brazil
Firmware and CAD (*computer aided design*) development for cutting and engraving laser machines. C/C++, ARM, FPGA, embedded systems, kinematics, communication protocols.
- 2009–2010 **Systems developer**, *Suntech*, Florianópolis, Brazil
Distributed systems, storage, database and communication protocols for lawful data interception. C++, Python and SQL (PostgreSQL)
- 2009–2009 **Systems developer**, *Khomp*, Florianópolis, Brazil
Development of firmware and linux device drivers for CTI applications (*computer telephony integration*). C/C++.

Publication list

- [37] Akash Dhasade, Rachid Guerraoui, Anne-Marie Kermarrec, Diana Petrescu, **Rafael Pires**, Mathis Randl, and Martijn de Vos, “Efficient federated search for retrieval-augmented generation using lightweight routing,” in *26th IFIP International Conference on Distributed Applications and Interoperable Systems (DAIS '26)*, **Best Paper Award**, 2026. DOI: 10.1007/978-3-032-27358-1_1 arXiv: 2502.19280.
- [36] Zachary Doucet, Rishi Sharma, Martijn de Vos, **Rafael Pires**, Anne-Marie Kermarrec, and Oana Balmau, “HarMoEny: Efficient multi-GPU inference of MoE models,” in *40th IEEE International Parallel and Distributed Processing Symposium (IPDPS '26)*, 2026. DOI: 10.1109/IPDPS65963.2026.00069 arXiv: 2506.12417.
- [35] Sami Abuzakuk, Lucas Crijns, Anne-Marie Kermarrec, **Rafael Pires**, and Martijn de Vos, “RIVA: Leveraging LLM agents for reliable configuration drift detection,” in *6th Workshop on Machine Learning and Systems (EuroMLSys '26)*, 2026. DOI: 10.1145/3805621.3807644 arXiv: 2603.02345.
- [34] Sami Abuzakuk, Oana Balmau, Jiaxuan Chen, Anne-Marie Kermarrec, **Rafael Pires**, Ramya Prabhu, and Martijn de Vos, “The cost of expertise: Understanding MoE decode performance,” in *6th Workshop on Machine Learning and Systems (EuroMLSys '26)*, 2026. DOI: 10.1145/3805621.3807659
- [33] Sami Abuzakuk, Anne-Marie Kermarrec, Palak, **Rafael Pires**, Rishi Sharma, and Martijn de Vos, “Orbit: Efficient agentic inference using priority scheduling,” in *6th Workshop on Machine Learning and Systems (EuroMLSys '26)*, 2026. DOI: 10.1145/3805621.3807661
- [32] Shai Bergman, Anne-Marie Kermarrec, Diana Petrescu, **Rafael Pires**, Mathis Randl, Martijn de Vos, and Ji Zhang, “Leveraging approximate caching for faster retrieval-augmented generation,” in *26th ACM/IFIP International Middleware Conference (Middleware '25)*, 2025. DOI: 10.1145/3721462.3770776 arXiv: 2503.05530.
- [31] Mohamed Yassine Boukhari, Akash Dhasade, Anne-Marie Kermarrec, **Rafael Pires**, Othmane Safsafi, and Rishi Sharma, “Boosting resource-constrained federated learning systems with guessed updates,” *IEEE Transactions on Parallel and Distributed Systems*, pp. 1–15, 2025. DOI: 10.1109/TPDS.2025.3578522 arXiv: 2110.11486.
- [30] Sayan Biswas, Anne-Marie Kermarrec, Alexis Marouani, **Rafael Pires**, Rishi Sharma, and Martijn de Vos, “Boosting asynchronous decentralized learning with model fragmentation,” in *The Web Conference (WWW '25)*, 2025. DOI: 10.1145/3696410.3714872 arXiv: 2410.12918.
- [29] Sayan Biswas, Mathieu Even, Anne-Marie Kermarrec, Laurent Massoulié, **Rafael Pires**, Rishi Sharma, and Martijn de Vos, “Noiseless privacy-preserving decentralized learning,” *Proceedings on Privacy Enhancing Technologies Symposium (PoPETs '25)*, vol. 2025, no. 1, 824–844, 2025. DOI: 10.56553/popets-2025-0043 arXiv: 2404.09536.
- [28] Sayan Biswas, Davide Frey, Romaric Gaudel, Anne-Marie Kermarrec, Dimitri Lerévérénd, **Rafael Pires**, Rishi Sharma, and François Taïani, “Low-cost privacy-aware decentralized learning,” *Proceedings on Privacy Enhancing Technologies Symposium (PoPETs '25)*, vol. 2025, no. 3, 451–474, 2025. DOI: 10.56553/popets-2025-0108 arXiv: 2403.11795.

- [27] Shai Bergman, Zhang Ji, Anne-Marie Kermarrec, Diana Petrescu, **Rafael Pires**, Mathis Randl, and Martijn de Vos, “Leveraging approximate caching for faster retrieval-augmented generation,” in *5th Workshop on Machine Learning and Systems (EuroMLSys’25)*, 2025. DOI: 10.1145/3721146.3721941 arXiv: 2503.05530.
- [26] Rachid Guerraoui, Anne-Marie Kermarrec, Diana Petrescu, **Rafael Pires**, Mathis Randl, and Martijn de Vos, “Efficient federated search for retrieval-augmented generation,” in *5th Workshop on Machine Learning and Systems (EuroMLSys’25)*, 2025. DOI: 10.1145/3721146.3721942 arXiv: 2502.19280.
- [25] Oana Balmau, Anne-Marie Kermarrec, **Rafael Pires**, André Loureiro Espírito Santo, Martijn de Vos, and Milos Vujasinovic, “Accelerating MoE model inference with expert sharding,” in *5th Workshop on Machine Learning and Systems (EuroMLSys’25)*, 2025. DOI: 10.1145/3721146.3721940 arXiv: 2503.08467.
- [24] Akash Dhasade, Anne-Marie Kermarrec, Tuan-Anh Nguyen, **Rafael Pires**, and Martijn de Vos, “Harnessing increased client participation with cohort-parallel federated learning,” in *5th Workshop on Machine Learning and Systems (EuroMLSys’25)*, 2025. DOI: 10.1145/3721146.3721939 arXiv: 2405.15644.
- [23] Marie Reinbigler, Rishi Sharma, **Rafael Pires**, Elisabeth Brunet, Anne-Marie Kermarrec, and Catalin Fetita, “Efficient pyramidal analysis of gigapixel images on a decentralized modest computer cluster,” in *31st International European Conference on Parallel and Distributed Computing (Euro-Par ’25)*, 2025.
- [22] Youssef Allouah, Akash Dhasade, Rachid Guerraoui, Nirupam Gupta, Anne-Marie Kermarrec, Rafael Pinot, **Rafael Pires**, and Rishi Sharma, “Revisiting ensembling in one-shot federated learning,” in *38th Annual Conference on Neural Information Processing Systems (NeurIPS ’24)*, 2024. arXiv: 2411.07182. [Online]. Available: https://proceedings.neurips.cc/paper_files/paper/2024/hash/7ea46207ec9bda974b140fe11d8dd727-Abstract-Conference.html
- [21] Martijn de Vos, Sadegh Farhadkhani, Rachid Guerraoui, Anne-Marie Kermarrec, **Rafael Pires**, and Rishi Sharma, “Epidemic learning: Boosting decentralized learning with randomized communication,” in *37th Annual Conference on Neural Information Processing Systems (NeurIPS ’23)*, 2023. arXiv: 2310.01972. [Online]. Available: https://proceedings.neurips.cc/paper_files/paper/2023/hash/7172e147d916eef4cb1eb30016ce725f-Abstract-Conference.html
- [20] Akash Dhasade, Anne-Marie Kermarrec, **Rafael Pires**, Rishi Sharma, Milos Vujasinovic, and Jeffrey Wigger, “Get more for less in decentralized learning systems,” in *2023 IEEE 43rd International Conference on Distributed Computing Systems (ICDCS ’23)*, 2023, pp. 463–474. DOI: 10.1109/ICDCS57875.2023.00067 arXiv: 2306.04377.
- [19] Akash Dhasade, Anne-Marie Kermarrec, **Rafael Pires**, Rishi Sharma, and Milos Vujasinovic, “Decentralized learning made easy with DecentralizePy,” in *3rd Workshop on Machine Learning and Systems (EuroMLSys ’23)*, 2023, 34–41. DOI: 10.1145/3578356.3592587 arXiv: 2304.08322.
- [18] Akash Dhasade, Nevena Dresevic, Anne-Marie Kermarrec, and **Rafael Pires**, “TEE-based decentralized recommender systems: The raw data sharing redemption,” in *2022 IEEE International Parallel and Distributed Processing Symposium (IPDPS ’22)*, 2022, pp. 447–458. DOI: 10.1109/IPDPS53621.2022.00050 arXiv: 2202.11655.
- [17] Vlad Crăciun, Pascal Felber, Andrei Mogage, Emanuel Onica, and **Rafael Pires**, “Malware in the SGX supply chain: Be careful when signing enclaves!” *IEEE Transactions on Dependable and Secure Computing (TDSC)*, vol. 19, no. 2, pp. 924–935, 2022. DOI: 10.1109/TDSC.2020.3024562 arXiv: 1907.05096.
- [16] Rémi Dulong, **Rafael Pires**, Andreia Correia, Valerio Schiavoni, Pedro Ramalhete, Pascal Felber, and Gaël Thomas, “NVCache: A plug-and-play NVMM-based I/O booster for legacy systems,” in *2021 51st Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN ’21)*, 2021, pp. 186–198. DOI: 10.1109/DSN48987.2021.00033 arXiv: 2105.10397.
- [15] Franz Gregor, Wojciech Ozga, Sébastien Vaucher, **Rafael Pires**, Do Le Quoc, Sergei Arnautov, André Martin, Valerio Schiavoni, Pascal Felber, and Christof Fetzer, “Trust management as a service: Enabling trusted execution in the face of Byzantine stakeholders,” in *2020 50th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN ’20)*, 2020, pp. 502–514. DOI: 10.1109/DSN48063.2020.00063 arXiv: 2003.14099.
- [14] **Rafael Pereira Pires**, “Distributed systems and trusted execution environments: Trade-offs and challenges,” Ph.D. dissertation, University of Neuchâtel, 2020. DOI: 10.35662/unine-thesis-2812 arXiv: 2001.09670.

- [13] Stefan Contiu, Sébastien Vaucher, **Rafael Pires**, Marcelo Pasin, Pascal Felber, and Laurent Réveillère, “Anonymous and confidential file sharing over untrusted clouds,” in *2019 38th Symposium on Reliable Distributed Systems (SRDS '19)*, 2019, pp. 21–2110. DOI: 10.1109/SRDS47363.2019.00013 arXiv: 1907.06466.
- [12] Andrei Mogage, **Rafael Pires**, Vlad Crăciun, Emanuel Onica, and Pascal Felber, “Supply chain malware targets SGX: Take care of what you sign,” in *2019 38th Symposium on Reliable Distributed Systems (SRDS '19)*, 2019, pp. 52–528. DOI: 10.1109/SRDS47363.2019.00016 arXiv: 1907.05096v3.
- [11] Christian Göttel, **Rafael Pires**, Isabelly Rocha, Sébastien Vaucher, Pascal Felber, Marcelo Pasin, and Valerio Schiavoni, “Security, performance and energy trade-offs of hardware-assisted memory protection mechanisms,” in *2018 IEEE 37th Symposium on Reliable Distributed Systems (SRDS '18)*, 2018, pp. 133–142. DOI: 10.1109/SRDS.2018.00024 arXiv: 1903.04203.
- [10] **Rafael Pires**, David Goltzsche, Sonia Ben Mokhtar, Sara Bouchenak, Antoine Boutet, Pascal Felber, Rüdiger Kapitza, Marcelo Pasin, and Valerio Schiavoni, “CYCLOSA: Decentralizing private web search through SGX-based browser extensions,” in *2018 IEEE 38th International Conference on Distributed Computing Systems (ICDCS '18)*, Vienna, Austria, 2018, pp. 467–477. DOI: 10.1109/ICDCS.2018.00053 arXiv: 1805.01548.
- [9] Sébastien Vaucher, **Rafael Pires**, Pascal Felber, Marcelo Pasin, Valerio Schiavoni, and Christof Fetzer, “SGX-aware container orchestration for heterogeneous clusters,” in *2018 IEEE 38th International Conference on Distributed Computing Systems (ICDCS '18)*, Vienna, Austria, 2018, pp. 730–741. DOI: 10.1109/ICDCS.2018.00076 arXiv: 1805.05847.
- [8] Stefan Contiu, **Rafael Pires**, Sébastien Vaucher, Marcelo Pasin, Pascal Felber, and Laurent Réveillère, “IBBE-SGX: Cryptographic group access control using trusted execution environments,” in *2018 48th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN '18)*, Luxembourg city, Luxembourg, 2018, pp. 207–218. DOI: 10.1109/DSN.2018.00032 arXiv: 1805.01563.
- [7] Sonia Ben Mokhtar, Antoine Boutet, Pascal Felber, Marcelo Pasin, **Rafael Pires**, and Valerio Schiavoni, “X-Search: Revisiting private web search using intel SGX,” in *18th ACM/IFIP/USENIX Middleware Conference (Middleware '17)*, Las Vegas, Nevada, 2017, 198–208. DOI: 10.1145/3135974.3135987 arXiv: 1805.01742.
- [6] Aurélien Havet, **Rafael Pires**, Pascal Felber, Marcelo Pasin, Romain Rouvoy, and Valerio Schiavoni, “SecureStreams: A reactive middleware framework for secure data stream processing,” in *Proceedings of the 11th ACM International Conference on Distributed and Event-Based Systems (DEBS '17)*, Barcelona, Spain, 2017, 124–133. DOI: 10.1145/3093742.3093927 arXiv: 1805.01752.
- [5] **Rafael Pires**, Daniel Gavril, Pascal Felber, Emanuel Onica, and Marcelo Pasin, “A lightweight MapReduce framework for secure processing with SGX,” in *2017 17th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGRID '17)*, Madrid, Spain, 2017, pp. 1100–1107. DOI: 10.1109/CCGRID.2017.129 arXiv: 1705.05684.
- [4] Florian Kelbert, Franz Gregor, **Rafael Pires**, Stefan Köpsell, Marcelo Pasin, Aurélien Havet, Valerio Schiavoni, Pascal Felber, Christof Fetzer, and Peter Pietzuch, “Securecloud: Secure big data processing in untrusted clouds,” in *Design, Automation & Test in Europe Conference & Exhibition (DATE '17)*, 2017, pp. 282–285. DOI: 10.23919/DATE.2017.7926999 arXiv: 1805.01783.
- [3] **Rafael Pires**, Marcelo Pasin, Pascal Felber, and Christof Fetzer, “Secure content-based routing using intel software guard extensions,” in *Proceedings of the 17th International Middleware Conference (Middleware '16)*, Trento, Italy, 2016, 10:1–10:10. DOI: 10.1145/2988336.2988346 arXiv: 1701.04612.
- [2] **Rafael Pires**, Giovanni Gracioli, Lucas Wanner, and Antonio Augusto Medeiros Fröhlich, “Evaluation of an RSSI-based location algorithm for wireless sensor networks,” *IEEE Latin America Transactions*, vol. 9, no. 1, pp. 830–835, 2011. DOI: 10.1109/TLA.2011.5876427
- [1] **Rafael Pires**, Lucas Francisco Wanner, and Antonio Augusto Fröhlich, “An efficient calibration method for RSSI-based location algorithms,” in *2008 6th IEEE International Conference on Industrial Informatics*, 2008, pp. 1183–1188. DOI: 10.1109/INDIN.2008.4618282

■ Bibliometrics

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Citations	1021	646
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* according to Google Scholar on 09.07.2026