Rafael Ferreira da Silva, Ph.D.

Oak Ridge National Laboratory
silvarf@ornl.gov · https://rafaelsilva.com
+1 865-341-1894

Section Head (Interim) • Senior Research Scientist

I am a Senior Research Scientist and Section Head (Interim) for Data and AI Systems research in the Computer Science and Mathematics division at Oak Ridge National Laboratory (ORNL), leading research and development in AI, data and agentic workflows, and advanced computing systems.

Strategic and operational leadership for **45+** researchers across five groups; **$65M+** in funded awards across **21** competitively reviewed proposals; Co-PI for Transformational AI model consortium (ModCon) - DOE Genesis Mission; PI for robotics and automated laboratories project supporting Genesis; **21** competitively reviewed grants led or co-led; **8** best paper awards at international conferences; **156** peer-reviewed publications (**76** since **2020**); Senior Member of ACM, IEEE

Signature initiatives: **Workflows Community Initiative** (290+); **WfCommons** (54); **WRENCH** (40).

MAJOR FUNDED PROGRAMS

ModCon – Transformational AI model consortium — $30,000,000
Co-Principal Investigator • Office of Advanced Scientific Computing Research (ASCR) • DOE — 10/2025-09/2027

MINT: Model INTegration through Knowledge-Rich Data and Process Composition — $12,979,881
Co-Principal Investigator • World Modelers • DARPA — 12/2017–11/2021

OPAL – Orchestrated Platform for Autonomous Laboratories — $12,500,000
Senior Personnel • Offices of Biological & Environmental Research (BER) and Advanced Scientific Computing Research (ASCR) • DOE — 10/2025-09/2027

ExaWorks: ECP Workflows Project — $3,773,833
Co-Principal Investigator • Exascale Computing Project • DOE — 2017-12/2023

PROFESSIONAL APPOINTMENTS

Oak Ridge National Laboratory, USA
Section Head (Interim), Data and AI Systems, Computer Science and Mathematics — 2025-present
Group Leader, Workflow and Ecosystem Services, National Center for Computational Sciences — 2023-2025
Senior Research Scientist — 2021-present

Workflows Community Initiative (WCI)
Co-Founder and Executive Director — 2022-present

Future Generation Computer Systems Journal
Special Issues Editor-in-Chief — 2023-2025

University of Southern California, Department of Computer Science, USA
Adjunct Research Assistant Professor — 2021-2024
Research Assistant Professor — 2016-2021

University of Southern California, Information Sciences Institute, USA
Research Lead — 2019-2021
Computer Scientist — 2013-2019

Centre National de la Recherche Scientifique (CNRS), France
Software Engineer — 2010-2013

EDUCATION

Doctor of Philosophy in Computer Science 2013
Institut National des Sciences Appliquées de Lyon, France
Thesis: A science-gateway for workflow executions: online and non-clairvoyant self-healing of workflow executions on grids

Master of Science in Computer Science 2010
Federal University of Campina Grande (UFCG), Brazil

Bachelor of Science in Computer Science 2007
Federal University of Paraiba (UFPB), Brazil

RESEARCH FOCUS

My research sits at the intersection of advanced distributed systems and scientific innovation, spanning scientific workflows, agentic workflows and provenance capture, autonomous science, and hybrid quantum-classical systems. I provide strategic direction and leadership for scheduling, modeling, and optimization methods that scale across cloud, edge, and HPC environments.

Focus areas: **Scientific Workflows**; **Agentic Workflows**; **Autonomous Science**; **Hybrid Quantum-Classical Systems**; **Workflow Scheduling and Optimization**; **Modeling and Simulation of Distributed Systems**; **Cyberinfrastructure**; **AI-driven Data Analytics**; **Provenance Capture**; **High Performance Computing (HPC)**; **Cloud and Edge Computing**.

SELECTED RECENT PUBLICATIONS (LAST 10)

[156] Taufer, Michela and **Ferreira da Silva, Rafael** and Mintz, Benjamin and Abolhasani, Milad and Badia, Rosa M. and Deelman, Ewa and Moore, Robert G. and Shalf, John. "A2SD: Accelerating Scientific Innovation Through Autonomous Discovery Systems". *High Performance Computing*. 2026. DOI: 10.1007/978-3-032-07612-0_52.

[155] Widener, Patrick and Biven, Laura and Foster, Ian T. and Plale, Beth and Oral, Sarp and **Ferreira da Silva, Rafael**. "Scientific Data Management Beyond Traditional Computing Boundaries". *IEEE Computer*. 2026. DOI: 10.1109/MC.2025.3589134.

[154] Shehata, Amir and Groszkowski, Peter and Naughton, Thomas and Gopalakrishnan Meena, Muralikrishnan and Wong, Elaine and Claudino, Daniel and **Ferreira da Silva, Rafael** and Beck, Thomas. "Bridging Paradigms: Designing for HPC-Quantum Convergence". *Future Generation Computer Systems*. 2026. DOI: 10.1016/j.future.2025.107980.

[153] Frédéric Suter and Tainã Coleman and Ílkay Altintas and Rosa M. Badia and Bartosz Balis and Kyle Chard and Iacopo Colonnelli and Ewa Deelman and Paolo Di Tommaso and Thomas Fahringer and Carole Goble and Shantenu Jha and Daniel S. Katz and Johannes Köster and Ulf Leser and Kshitij Mehta and Hilary Oliver and J.-Luc Peterson and Giovanni Pizzi and Loïc Pottier and Raül Sirvent and Eric Suchyta and Douglas Thain and Sean R. Wilkinson and Justin M. Wozniak and **Ferreira da Silva, Rafael**. "A Terminology for Scientific Workflow Systems". *Future Generation Computer Systems*. 2026. DOI: 10.1016/j.future.2025.107974.

[152] Shin, Woong and Souza, Renan and Rosendo, Daniel and Suter, Frédéric and Wang, Feiyi and Balaprakash, Prasanna and **Ferreira da Silva, Rafael**. "The (R)evolution of Scientific Workflows in the Agentic AI Era: Towards Autonomous Science". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767580.

[151] Souza, Renan and Poteet, Timothy and Etz, Brian and Rosendo, Daniel and Gueroudji, Amal and Shin, Woong and Balaprakash, Prasanna and **Ferreira da Silva, Rafael**. "LLM Agents for Interactive Workflow Provenance: Reference Architecture and Evaluation Methodology". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767582.

[150] McDonald, Jesse and Wong, Yick-Ching and Mehta, Kshitij and Suter, Frédéric and **Ferreira da Silva, Rafael** and Pottier, Loïc and Deelman, Ewa and Casanova, Henri. "Determining Levels of Detail for Simulators of Parallel and Distributed Computing Systems via Automated Calibration". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767698.

[149] Maheshwari, Ketan and Borch, Anderson and Webb, Jordan and Etz, Brian and Miller, Ross and Suter, Frédéric and Oral, Sarp and **Ferreira da Silva, Rafael**. "Evaluating HPC Scheduling Strategies for Urgent Workloads". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767474.

[148] Rosendo, Daniel and DeWitt, Stephen and Souza, Renan and Austria, Phillipe and Ghosal, Tirthankar and McDonnell, Marshall and Miller, Ross and Skluzacek, Tyler J. and Haley, James and Turcksin, Bruno and McGaha, Jesse and Mintz, Benjamin and Wang, Feiyi and Shankar, Mallikarjun and Oral, Sarp and **Ferreira da Silva, Rafael**. "AI Agents for Enabling Autonomous

Experiments at ORNL's HPC and Manufacturing User Facilities". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767592.

[147] Godoy, William and Melnichenko, Tatiana and Valero-Lara, Pedro and Elwasif, Wael and Fackler, Philip and **Ferreira da Silva, Rafael** and Teranishi, Keita and Vetter, Jeffrey. "Mojo: MLIR-based Performance-Portable HPC Science Kernels on GPUs for the Python Ecosystem". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767573.

AWARDS & HONORS (8 BEST PAPER AWARDS)

Best Short Paper Award • PEARC '25 Practice and Experience in Advanced Research Computing 2025 — 2025

Secure API-Driven Research Automation to Accelerate Scientific Discovery

Best Paper Award • 2024 6th Annual Workshop on Extreme-Scale Experiment-in-the-Loop Computing (XLOOP) — 2024

Integrating ORNL's HPC and Neutron Facilities with a Performance-Portable CPU/GPU Ecosystem

Best Paper Award • 2023 IEEE/ACM Workshop on Workflows in Support of Large-Scale Science (WORKS) — 2023

Julia as a unifying end-to-end workflow language on the Frontier exascale system

Best Paper Candidate • 19th IEEE Conference on eScience (eScience 23) — 2023

Driving Next-Generation Workflows from the Data Plane

Future Generation Computer Systems 2021 Best Paper Award — 2021

End-to-End Online Performance Data Capture and Analysis for Scientific Workflows

FGCS Fall 2024 Editor's Choice Papers — 2024

Integrating Quantum Computing Resources into Scientific HPC Ecosystems

IEEE Senior Member Elevation • IEEE — 2022

ACM Senior Member Elevation • ACM — 2023

FUNDING AWARDS

Total: $65,000,000+ across 21 competitively reviewed proposals

U.S. Department of Energy (DOE)

ModCon – Transformational AI model consortium — $30,000,000

Co-Principal Investigator, 10/2025-09/2027

OPAL – Orchestrated Platform for Autonomous Laboratories — $12,500,000

Senior Personnel, 10/2025-09/2027

A Testbed for Multi-Agent Autonomous Science: From Lab Bench to Supercomputer — $250,000

Principal Investigator, 10/2025-09/2026

Center for Sustaining Workflows and Application Services — $120,000

Principal Investigator, 04/2023-04/2024

ExaWorks: ECP Workflows Project — $3,773,833

Co-Principal Investigator, 2017-12/2023

U.S. National Science Foundation (NSF)

Collaborative Research: OAC Core: Simulation-driven runtime resource management for distributed workflow applications — $499,988

Co-Principal Investigator, 10/2021-09/2024 (#2106059, #2106147)

Collaborative Research: Elements: Simulation-driven Evaluation of Cyberinfrastructure Systems — $600,000

Principal Investigator, 08/2021-07/2024 (#2103489, #2103508)

Collaborative Research: EAGER: VisDict - Visual Dictionaries for Enhancing the Communication between Domain Scientists and Scientific Workflow Providers $264,500

Co-Principal Investigator, 05/2021-10/2022 (#2100561, #2100636)

REU Site: SURF-I: Safe, Usable, Resilient and Fair Internet $405,000

Co-Principal Investigator, 03/2021-02/2024 (#2051101)

CCRI: Planning: Collaborative Research: Infrastructure for Enabling Systematic Development and Research of Scientific Workflow Management Systems $100,000

Principal Investigator, 10/2020-09/2021 (#2016610, #2016619, #2016682)

Collaborative Research: PPoSS: Planning: Performance Scalability, Trust, and Reproducibility: A Community Roadmap to Robust Science in High-throughput Applications $250,000

Co-Principal Investigator, 10/2020-09/2021 (#2028881, #2028923, #2028930, #2028955, #2028956)

Collaborative Research: CyberTraining: Implementation: Small: Integrating core CI literacy and skills into university curricula via simulation-driven activities $500,000

Co-Principal Investigator, 10/2019–09/2022 (#1923539, #1923621)

Coordinating Curricula and User Preferences to Increase the Participation of Women and Students of Color in Engineering $300,000

Co-Principal Investigator, 10/2018–09/2021 (#1826632)

BIGDATA: IA: Collaborative Research: In Situ Data Analytics for Next Generation Molecular Dynamics Workflows $1,993,043

Co-Principal Investigator, 10/2017–09/2021 (#1741057, #1740990, #1741040)

Collaborative Research: SI2-SSE: WRENCH: A Simulation Workbench for Scientific Workflow for Users, Developers, and Researchers $497,956

Co-Principal Investigator, 01/2017—12/2019 (#1642369, #1642335)

2018 Software Infrastructure for Sustained Innovation (SI2) Principal Investigators Workshop $85,065

Co-Principal Investigator, 06/2018–05/2019 (#1831393)

U.S. Defense Advanced Research Projects Agency (DARPA)

MINT: Model INTegration through Knowledge-Rich Data and Process Composition $12,979,881

Co-Principal Investigator, 12/2017–11/2021

International Funding / Collaborations / Others

Integrating Cyberinfrastructure Literacy into University Curricula $4,400

Principal Investigator, 08/2021 – 05/2022

Teaching Parallel and Distributed Computing Concepts in Simulation $3,300

Principal Investigator, 08/2020 – 05/2021

Integrating core CI literacy and skills into university curricula via simulation-driven activities $2,825

Principal Investigator, 08/2019 – 05/2020

Laboratoire Virtuel pour la Conception de Systèmes de Gestion de Workflows 24,000 €

1/2016–12/2018

PROFESSIONAL ACTIVITIES

Steering Committees

Conference/Workshop Chair Roles

Student Program Chair, ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC), Notre Dame, IN, USA, 2025

Publication Chair, ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC), Pisa, Italy, 2024

Publication Chair, ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC), Orlando, USA, 2023

Poster Chair, International Conference on Parallel Processing (ICPP), San Diego, CA, USA, 2025

Track Chair: Data Analytics, Visualization, & Storage, IEEE/ACM The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC), USA, 2024

Program Chair, IEEE eScience Conference (eScience), Limassol, Cyprus, 2023

Publicity and Web Chair, IEEE eScience Conference (eScience), Salt Lake City, USA, 2022

Publicity Chair, IEEE eScience Conference (eScience), Innsbruck, Austria, 2021

Track Chair: Software Tools & Infrastructure, IEEE eScience Conference (eScience), San Diego, USA, 2019

Program Chair, IEEE Workflows in Support of Large-Scale Science Workshop (WORKS), Dallas, USA, 2022

Program Chair, IEEE Workflows in Support of Large-Scale Science Workshop (WORKS), Saint-Louis, USA, 2021

Program Chair, IEEE Workflows in Support of Large-Scale Science Workshop (WORKS), Atlanta, USA, 2020

Program Chair, IEEE Workflows in Support of Large-Scale Science Workshop (WORKS), Denver, USA, 2019

Program Chair, IEEE Workflows in Support of Large-Scale Science Workshop (WORKS), Dallas, USA, 2018

Publicity Chair, IEEE Workflows in Support of Large-Scale Science Workshop (WORKS), Denver, USA, 2017

Publicity Chair, IEEE Workflows in Support of Large-Scale Science Workshop (WORKS), Salt Lake City, USA, 2016

Track Chair: Performance Evaluation, IEEE International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD), Porto Alegre, Brazil, 2023

Local Arrangements Chair, IEEE International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD), Los Angeles, USA, 2016

Program Chair, Workshop on E-science ReseaRch leading tO negative ResultsWorkshop (ERROR), Salt Lake City, USA, 2022

Publication Chair, Gateways 2022 (Gateways), San Diego, CA, USA, 2022

Program Chair, Bridging from Concepts to Data and Computation for eScience Workshop (BC2DC), San Diego, CA, 2019

Organizer, Software Infrastructure for Sustained Innovation Principal Investigator Workshop (NSF SI2 PI Meeting), Washington D.C., USA, 2018

Program Committee Member

IEEE/ACM The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC): 2026, 2025, 2023, 2021

IEEE ISC High Performance (ISC-HPC): 2026, 2025

ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC): 2026, 2025, 2024, 2023, 2022

IEEE International Conference on Cluster Computing (CLUSTER): 2025, 2023, 2021, 2019, 2018, 2017

IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGrid): 2025, 2023, 2022, 2017, 2016, 2015

Platform for Advanced Scientific Computing (PASC): 2025, 2022

ACM/SIGAPP Symposium On Applied Computing (SAC): 2025

IEEE eScience Conference (eScience): 2025, 2024

International European Conference on Parallel and Distributed Computing (Euro-Par): 2025, 2024, 2023

IEEE International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD): 2025, 2022, 2021, 2019, 2018, 2017, 2016

International Conference on Parallel Processing (ICPP): 2024, 2023, 2019

IEEE International Conference on Cloud Computing (CLOUD): 2023

IEEE International Parallel & Distributed Processing Symposium (IPDPS): 2022, 2021

Workflows in Support of Large-Scale Science (WORKS): 2025, 2024, 2020, 2019, 2018, 2017, 2016

Workshop on Extreme-Scale Experiment-in-the-Loop Computing (XLOOP): 2025, 2024

International Workshop on Science Gateways (IWSG): 2025, 2024, 2023

IEEE/ACM International Workshop on Clouds and Edge Computing, and Applications Management (CloudAM): 2021, 2020, 2019, 2018, 2017, 2016, 2015, 2014

Workshop on Monitoring and Analysis for HPC Systems Plus Applications (HPCMASPA): 2021

Workshop on Reproducible Workflows, Data Management, and Security (ReWorDS): 2022, 2021

Workshop on High Performance Serverless Computing (HiPS): 2021

IEEE International Conference on Distributed Computing Systems (ICDCS): 2020

International Conference on High Performance Computing & Simulation (HPCS): 2018, 2017

International Workshop on Reproducible Open Science (RepScience): 2016

Editorial Positions

Special Issue Editor-in-Chief, *Future Generation Computer Systems* (2023-2025)

Associated Editor, *Journal of Parallel and Distributed Computing* (2019-2024)

Editor, *Future Generation Computer Systems* (2020-2023)

Guest Editor, *Computing in Science & Engineering* (2023)

Guest Editor, *Future Generation Computer Systems* (2018)

Funding Review Panels

In-person and Virtual Review Panels Reviewer, U.S. National Science Foundation (NSF) (2017-2026)

Mail In Reviews, U.S. Department of Energy (DoE) (2021-2025)

Ad-hoc Reviewer, Austrian Science Fund (FWF) (2024-2025)

Ad-hoc Reviewer, U.S. Army Research Office (ARO) (2020)

Ad-hoc reviewer, Netherlands Organisation for Scientific Research (NWO) (2019)

INVITED TALKS

2026

Enabling quantum-HPC convergence for future scientific workflows

Journées Informatique Quantique 2026, Bordeaux, France

2025

AI-Ready Scientific Workflows at Scale: Bridging Data, Infrastructure, and Automation

First International Symposium on Artificial Intelligence and Extreme-Scale Workflows (AIExScale), St. Louis, USA

Advancing Reproducible and Secure Workflows for Autonomous Science at Scale

Keynote for the 5th Workshop on Reproducible Workflows, Data Management, and Security (ReWorDS), Chicago, USA

Building Next-Generation Scientific Workflows for Autonomous Research Facilities

Multicore World XII, Christchurch, New Zealand

Building Next-Generation Scientific Workflows for Autonomous Research Facilities

SIGHPC Computing Continuum Chapter, Virtual

2024

The Evolution of Scientific Workflows

Science and Technology Facilities Council (STFC) at UK Research and Innovation (UKRI), Virtual

DOE's Integrated Research Infrastructure (IRI) Program

Low Energy Community Meeting 2024, Knoxville, TN, USA

National Scale Research Workflows and Community Development

ABRF 2024 Annual Meeting, Minneapolis, MN, USA

2023

Modern Scientific Workflows in the Era of an Integrated Research Infrastructure

Monterey Data Conference 2023, Monterey, CA, USA

The Workflows Community Initiative and Recent Summit

U.S. National Science Foundation (NSF) Office of Advanced Cyberinfrastructure (OAC) Brownbag, Virtual

An Overview of AI Workflows for HPC Systems

Middleware and Grid Interagency Coordination (MAGIC) Meeting, Virtual

Modern Scientific Workflows: State-of-the-art and Challenges

2023 Computer Science Department Inaugural Lecture, Fluminense Federal University, Rio de Janeiro, Brazil

TEACHING EXPERIENCE

INF 553 Data Mining (graduate) — Fall 2018
USC

CS 104 Data Structures and Object-Oriented Design (undergraduate) — Spring 2017
USC

AFFILIATIONS & CERTIFICATIONS

Professional Memberships

IEEE, Senior Member	2022-present
ACM, Senior Member	2023-present
ACM, Member	2018-2023
IEEE, Member	2017-2022

Certifications

Ground Instructor, Federal Aviation Administration	December 2020
Private Aircraft Pilot, Federal Aviation Administration	November 2020

STUDENTS & MENTORING

PhD Students

Tainã Coleman, Ph.D. in Computer Science (2020-2023)

Student Workers / Interns

Jason Feuerstein, B.S. in Computer Science (2020-2021)

Tabitha See Ya Lee, B.S. in Computer Science (Vanderbilt University) (2020-2020)

Vivian (Tongyu) Zhu, B.S. in Computer Science (2019-2020)

Gautam Jethwani, B.S. in Computer Science (2018-2021)

Samuel He, B.S. in Computer Science (2020-2020)

James Oeth, B.S. in Computer Science (2017-2018)

Directed Research Students

Manav Kaushik, undergraduate student, B.S. in Computer Science (Spring 2021)

Gautam Jethwani, undergraduate student, B.S. in Computer Science (Fall 2019)

James Oeth, undergraduate student, B.S. in Computer Science (Fall 2019)

Prithvi Kumar, graduate student, M.S. in Computer Science (Spring 2019)

Radhika Agarwal, graduate student, M.S. in Computer Science (Spring 2019)

Varad Kulkarni, graduate student, M.S. in Computer Science (Spring 2019)

Spencer Albrecht, undergraduate student, B.S. in Computer Science (Spring 2019)

Shiva Deviah, graduate student, M.S. in Computer Science (Spring 2019)

Vishal Oswal, graduate student, M.S. in Computer Science (Fall 2017)

Harshil Shah, graduate student, M.S. in Computer Science (Fall 2017)

Akshay Joshi, graduate student, M.S. in Computer Science (Fall 2017)

Thesis Committee Member

Alok Kamatar, MS Thesis, University of Chicago, USA (2025)

Alessio Orsino, PhD Thesis, University of Calabria, Italy (2025)

Aymen Al Saadi, PhD Thesis, Rutgers University, USA (2024)

Tainã Coleman, PhD Thesis, University of Southern California, USA (2023)

PUBLICATIONS (156 TOTAL)

2026

[156] Taufer, Michela and **Ferreira da Silva, Rafael** and Mintz, Benjamin and Abolhasani, Milad and Badia, Rosa M. and Deelman, Ewa and Moore, Robert G. and Shalf, John. "A2SD: Accelerating Scientific Innovation Through Autonomous Discovery Systems". *High Performance Computing*. 2026. DOI: 10.1007/978-3-032-07612-0_52.

[155] Widener, Patrick and Biven, Laura and Foster, Ian T. and Plale, Beth and Oral, Sarp and **Ferreira da Silva, Rafael**. "Scientific Data Management Beyond Traditional Computing Boundaries". *IEEE Computer*. 2026. DOI: 10.1109/MC.2025.3589134.

[154] Shehata, Amir and Groszkowski, Peter and Naughton, Thomas and Gopalakrishnan Meena, Muralikrishnan and Wong, Elaine and Claudino, Daniel and **Ferreira da Silva, Rafael** and Beck, Thomas. "Bridging Paradigms: Designing for HPC-Quantum Convergence". *Future Generation Computer Systems*. 2026. DOI: 10.1016/j.future.2025.107980.

[153] Frédéric Suter and Tainã Coleman and Ílkay Altintas and Rosa M. Badia and Bartosz Balis and Kyle Chard and Iacopo Colonnelli and Ewa Deelman and Paolo Di Tommaso and Thomas Fahringer and Carole Goble and Shantenu Jha and Daniel S. Katz and Johannes Köster and Ulf Leser and Kshitij Mehta and Hilary Oliver and J.-Luc Peterson and Giovanni Pizzi and Loïc Pottier and Raül Sirvent and Eric Suchyta and Douglas Thain and Sean R. Wilkinson and Justin M. Wozniak and **Ferreira da Silva, Rafael**. "A Terminology for Scientific Workflow Systems". *Future Generation Computer Systems*. 2026. DOI: 10.1016/j.future.2025.107974.

2025

[152] Shin, Woong and Souza, Renan and Rosendo, Daniel and Suter, Frédéric and Wang, Feiyi and Balaprakash, Prasanna and **Ferreira da Silva, Rafael**. "The (R)evolution of Scientific Workflows in the Agentic AI Era: Towards Autonomous Science". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767580.

[151] Souza, Renan and Poteet, Timothy and Etz, Brian and Rosendo, Daniel and Gueroudji, Amal and Shin, Woong and Balaprakash, Prasanna and **Ferreira da Silva, Rafael**. "LLM Agents for Interactive Workflow Provenance: Reference Architecture and Evaluation Methodology". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767582.

[150] McDonald, Jesse and Wong, Yick-Ching and Mehta, Kshitij and Suter, Frédéric and **Ferreira da Silva, Rafael** and Pottier, Loïc and Deelman, Ewa and Casanova, Henri. "Determining Levels of Detail for Simulators of Parallel and Distributed Computing Systems via Automated Calibration". *Proceedings of the SC '25 Workshops of the International Conference for High Performance*

Computing, Networking, Storage and Analysis. 2025. DOI: 10.1145/3731599.3767698.

[149] Maheshwari, Ketan and Borch, Anderson and Webb, Jordan and Etz, Brian and Miller, Ross and Suter, Frédéric and Oral, Sarp and **Ferreira da Silva, Rafael**. "Evaluating HPC Scheduling Strategies for Urgent Workloads". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767474.

[148] Rosendo, Daniel and DeWitt, Stephen and Souza, Renan and Austria, Phillipe and Ghosal, Tirthankar and McDonnell, Marshall and Miller, Ross and Skluzacek, Tyler J. and Haley, James and Turcksin, Bruno and McGaha, Jesse and Mintz, Benjamin and Wang, Feiyi and Shankar, Mallikarjun and Oral, Sarp and **Ferreira da Silva, Rafael**. "AI Agents for Enabling Autonomous Experiments at ORNL's HPC and Manufacturing User Facilities". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767592.

[147] Godoy, William and Melnichenko, Tatiana and Valero-Lara, Pedro and Elwasif, Wael and Fackler, Philip and **Ferreira da Silva, Rafael** and Teranishi, Keita and Vetter, Jeffrey. "Mojo: MLIR-based Performance-Portable HPC Science Kernels on GPUs for the Python Ecosystem". *Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*. 2025. DOI: 10.1145/3731599.3767573.

[146] Gueroudji, Amal and Mallick, Tanwi and Souza, Renan and **Ferreira da Silva, Rafael** and Ross, Robert and Dorier, Matthieu and Carns, Philip and Chard, Kyle and Foster, Ian T.. "ControlA: Agentic Workflow Control Mechanisms for Reliable Science". *The Second International Workshop on AI Principles in Science Communication (Ai4SC)*. 2025. DOI: 10.1109/eScience65000.2025.00086.

[145] Souza, Renan and Gueroudji, Amal and DeWitt, Stephen and Rosendo, Daniel and Ghosal, Tirthankar and Ross, Robert and Balaprakash, Prasanna and **Ferreira da Silva, Rafael**. "PROV-AGENT: Unified Provenance for Tracking AI Agent Interactions in Agentic Workflows". *5th Workshop on Reproducible Workflows, Data Management, and Security (ReWorDS)*. 2025. DOI: 10.1109/eScience65000.2025.00093.

[144] Borch, Anderson and Maheshwari, Ketan and Wozniak, Justin M. and **Ferreira da Silva, Rafael**. "An LLM-enabled Workflow for Understanding and Evolving HPC Scheduling Practices". *ICPP Workshops '25: Workshop Proceedings of the 54th International Conference on Parallel Processing*. 2025. DOI: 10.1145/3750720.37572.

[143] **Ferreira da Silva, Rafael** and Abolhasani, Milad and Antonopoulos, Dionysios A and Biven, Laura and Coffee, Ryan and Foster, Ian T and Hamilton, Leslie and Jha, Shantenu and Mayer, Theresa and Mintz, Benjamin and Moore, Robert and Nimer, Salahudin and Paulson, Noah and Shin, Woong and Suter, Frédéric and Taheri, Mitra and Taufer, Michela and Washburn, Newell R.. "A Grassroots Network and Community Roadmap for Interconnected Autonomous Science Laboratories for Accelerated Discovery". *ICPP Workshops '25: Workshop Proceedings of the 54th International Conference on Parallel Processing*. 2025. DOI: 10.1145/3750720.3757292.

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