CBSOFT'25

XVI CONGRESSO BRASILEIRO DE SOFTWARE: TEORIA E PRÁTICA

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XIX Simpósio Brasileiro de Componentes, Arquiteturas e Reutilização de Software

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Prefácio

Welcome to SBCARS 2025, the 19th Brazilian Symposium on Software Components, Architectures, and Reuse. The symposium is promoted by the Brazilian Computer Society (SBC) and brings together Software Engineering researchers and practitioners who are engaged with the challenges of software product lines, component-based development, service-oriented architecture, software architecture, modularization, code analysis, reuse, program repair, and other related topics. This year, for the nineteenth time, the symposium is part of the Brazilian Conference on Software: Theory and Practice (CBSoft 2025), which integrates three other important symposia: the Brazilian Symposium on Software Engineering (SBES), the Brazilian Symposium on Programming Languages (SBLP), and the Brazilian Symposium on Systematic and Automated Software Testing (SAST). The technical program of SBCARS 2025 is very exciting. We are honoured to have a keynote given by Mathieu Acher (University of Rennes), whose research interest is Software Variability for Replicable Science. His keynote will present an approach based on "modelling, sampling, measuring, learning" to systematically explore variability spaces of neuroimaging pipelines. The papers selected cover a wide range of the symposium specific topics, such as software architecture, microservices, LLMs, IoT, sustainability, and tools. The papers were selected after a rigorous reviewing process by the Program Committee. We received 52 submissions, from which 39 were valid. Based on careful reviews, 11 research papers were selected (28% acceptance rate) for presentation and inclusion in the proceedings published in the SBC OpenLib (SOL) digital library. Each paper was reviewed by three members of the Program Committee, which comprised 47 members. The authors of best papers will be invited to submit an extended version to a special issue of the Journal of Software Engineering Research and Development (JSERD). We would like to thank all those people who contributed to this SBCARS edition, including the authors, the Program Committee members, and the additional reviewers, who have worked hard to come up with a high-quality technical program. Also, We would like to thank the CBSoft 2025 general organization team led by Kiev Gama (UFPE, Brazil), and Vinicius Garcia (UFPE, Brazil) for their invaluable assistance in several steps in this conference, and the CBSoft 2025 Proceedings Chairs, Carla Silva (UFPE, Brazil), Jéssyka Vilela (UFPE, Brazil), and Mariana Peixoto (UPE, Brazil), by assisting on the production of this volume. We also would like to thank the Publicity Chair led by Adolfo Neto (UTFPR). Additional thanks to the session chairs and to the Program Committee members who helped to select the best papers. We also thank the SBCARS Steering Committee members, Carla Bezerra (UFC, Brazil), Daniel Lucrédio (UFSCar, Brazil), Gustavo Pinto (UFPA, Brazil), Rodrigo Bonifácio (UnB, Brazil), Thelma Elita Colanzi (UEM, Brazil), Vinicius Cardoso Garcia (UFPE, Brazil). We wish you enjoy the technical program of SBCARS 2025 and have a fruitful symposium!

Mathieu Acher - University of Rennes/IRISA/Inria, France

Title: Software Variability for Replicable Science

Abstract. The ability to recreate computational results provides a solid foundation for scientific research. Yet, reproducibility and getting identical results with the original data, code, and environment are challenging, due to many uncontrolled or undocumented variability factors. When reproduction is achieved, replicability can be envisioned to check whether conclusions still hold or generalize when well-controlled changes – created by inevitable software variability – are introduced. In this talk, I will first provide evidence that deep software variability – spanning operating systems, compilers, input data, versions, and configurations, etc. – is impacting reproducibility and replicability in numerous fields of computational science. I will then present an approach based on "modelling, sampling, measuring, learning" to systematically explore variability spaces of neuroimaging pipelines. I will also illustrate how Masters` students et INSA Rennes leverage variability to reproduce and replicate studies in soccer, chess, and energy consumption. Throughout this talk, I will try to convince the audience that software-engineering and variability researchers have a key role to play for truly replicable science.

Short bio. Mathieu Acher is Professor at University of Rennes/IRISA/Inria, France. His research focuses on modelling, reverse engineering, and learning (deep) variability of software-intensive systems. Beyond its applicability, his research is original in combining software engineering and artificial intelligence techniques (symbolic reasoning, machine learning, generative AI). He is the author of more than 150 peer-reviewed publications in international journals and conferences. His work has received Most Influential Paper Award (SLE'19) and Best Paper Awards (SPLC'13, ICPE'19, SPLC'21, ICSR'22, MODELS'23, AST'24, ISSTA'24). Since 2021, he is a junior research fellow at Institut Universitaire de France (IUF). He is also co-chairing the défi Inria LLM4Code (2024-2028).