

Summary of the 12th Brazilian Conference on Software and the 1st Latin American School on Software Engineering

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1. CBSOFT 2021 OVERVIEW

The main goal of the Brazilian Conference on Software: Practice and Theory (CBSOFT) is to bring together researchers, practitioners, and students aiming at fostering the exchange of experience about the most recent research, tendencies, and theoretical and practical innovations in software. The conference is the top conference in the field of Latin America. In 2021, the conference was organized virtually by Dr. Karine Roggia, Dr. Cristiano Vasconcelos (UDESC), and Dr. Paulo Bousfield (Univille). This year, we had more than 450 participants registered to attend CBSOFT. CBSOFT 2021 held four traditional Brazilian symposia: (i) 35th Brazilian Symposium on Software Engineering (SBES); (ii) 25th Brazilian Symposium on Programming Languages (SBLP); (iii) 15th Brazilian Symposium on Software Components, Architectures, and Reuse (SBCARS); (iv) 6th Brazilian Symposium on Systematic Automated Software Testing (SAST).

In addition to the main symposia and the Latin American School on Software Engineering, CBSOFT 2021 also hosted four workshops: I Brazilian Workshop on Intelligent Software Engineering (ISE); I Workshop on Open Science Practices for Software Engineering (OpenScienSE); III Workshop de Modelagem e Simulação de Sistemas Intensivos em Software (III MSSiS); IX Workshop on Software Visualization, Evolution, and Maintenance (VEM).

A novelty of this edition of CBSOFT was the 1st *Latin American School on Software Engineering (LaSSE)*. This school aimed to help new and future Software Engineering researchers to be part of the larger Software Engineering community, launching a successful career while feeling joy in their life as researchers. This idea was presented to SIGSOFT during ICSE 2019 by Dr. Marco Gerosa and Dr. Rafael Prikladnicki. At that time, SIGSOFT was chaired by Dr. Thomas Zimmermann, who promptly embraced the idea and presented it to the Executive Committee. However, due to the issues caused by COVID in 2020, CBSOFT went virtual and the first edition of the school was postponed. In 2021, the idea was recirculated, and SIGSOFT made itself available to support CBSOFT to make the School a reality. The very First Latin American School on Software Engineering was coordinated by Dr. Igor Steinmacher (UTFPR) and Dr. Eduardo Almeida (UFBA).

In this report, we will focus on reporting the summary of the Latin America School in Software Engineering, followed by details about the Brazilian Conference on Software.

2. THE 1ST LATIN AMERICAN SCHOOL ON SOFTWARE ENGINEERING

The 1st Latin American School in Software Engineering (LaSSE) was supported by ACM SIGSOFT and took place virtually, collocated with CBSOFT 2021. The focus of the school was to bring graduate students and young researchers from Latin America to-

gether, to help build their careers.

The school was conceived focusing on showing how to launch a successful career while feeling joy as a researcher. The first step towards that was to explore potential pathways and understand more about the academic challenges and opportunities. In the school, the participant had the opportunity chances to listen to and interact with top researchers and to learn about their careers, how to publish, and hear about important topics usually not covered during their graduate studies.

2.1 LaSSE Program

LaSSE program was thought to accommodate students in different levels as well as early-career PhDs and provide the opportunity for interacting with researchers. Thus, we organized nine talks with recognized researchers, in addition to a panel. The talks and panel were organized in 4 sessions, on the two first days of CBSOFT. In addition to the interactive talks, LaSSE offered a unique opportunity for PhD students to receive mentorship from top researchers. We will present the details of the talks and the mentorship sessions in the following.

2.1.1 Technical Presentations

The first session of LaSSE focused on presenting topics related to publishing strategies and understanding how to have an enjoyable life as a researcher. This first session started with Dr. Christoph Treude (Senior Lecturer at the University of Melbourne), talking about publication strategies, and where and why to publish. The following two talks were delivered by Dr. Alessandro Garcia (PUC-Rio) and Dr. Geraldine Fitzpatrick (ACM Distinguished Speaker and Professor at TU Wien). These two talks covered academic career development and how to grow as a researcher.

The second session of LaSSE brought a talk about “rebuttals and response to reviewers” and was delivered by Dr. Marco Aurelio Gerosa (Northern Arizona University). This talk was followed by Dr. David Shepherd (Virginia Commonwealth University), who brilliantly discussed the role of “Marketing and Social Networking for Researchers.”

The third session, during the second day of the event, focused on more technical topics. The first talk was delivered by Dr. Claudia Bauzer de Medeiros (University of Campinas), and tackled Open Science, a very timely and insightful talk. The second talk focused on conducting robust and reliable Software Engineering research. Dr. Guilherme H. Travassos (Federal University of Rio de Janeiro) provoked the participants to think about why for what, and for whom their research is important.

The last session started with Dr. Daniel Tamburri (TOSEM Social Media Editor) talking about “The Do’s and Don’ts of ACM

TOSEM.” In the talk he talked about TOSEM scope and review process. Following that, Dr. Altigran Soares da Silva (Federal University of Amazonas) talked about his experience bringing together academia and startups, with the talk “Scratch my back, I’ll scratch yours.” The program was completed with the panel about Job Market with Dr. David Redmiles (University of California, Irvine), Dr. Ricardo Britto (Ericsson, Sweden), and Ingrid Nunes (Federal University of Rio Grande do Sul).

2.1.2 Mentoring program

The second part of LaSSE program was the mentoring, in which Ph.D. students and early career faculty had the opportunity of having a mentorship session with internationally recognized researchers (see Table 1).

Researcher	Affiliation
Ahmed Hassan	Queens University, Canada
Alessandro Garcia	Pontificia Universidade Catolica do Rio de Janeiro, Brazil
Altigran S. da Silva	Universidade Federal do Amazonas, Brazil
Anita Sarma	Oregon State University, USA
Christoph Treude	University of Adelaide, Australia
David Shepherd	Virginia Commonwealth University, USA
Fabio Calefato	University of Bari, Italy
Gail Murphy	University of British Columbia, Canada
Guilherme H. Travassos	Universidade Federal do Rio de Janeiro, Brazil
Gustavo Pinto	Universidade Federal do Pará, Brazil
Marcelo D’amorim	Universidade Federal do Pernambuco, Brazil
Marco A. Gerosa	Northern Arizona University, USA
Marcos Kalinowski	Pontificia Universidade Católica do Rio de Janeiro, Brazil
Rafael Prikladnicki	Pontificia Universidade Católica do Rio Grande do Sul, Brazil
Sarah Nadi	University of Alberta, Canada
Sebastian Urchitel	Universidad de Buenos Aires, Argentina/ Imperial College, UK
Tayana U. Conte	Universidade Federal do Amazonas, Brazil

Table 1: Researchers who mentored PhD students

The goal of the mentorship was to empower Latin American students and early career researchers, showing them that there is potential in our research. Developing as a young scientist and achieving impact through publications in top scientific venues (like ICSE, FSE, TOSEM) is a challenge that requires creativity and rigorous validation and communication skills, understanding how communities work and how to get results disseminated.

We have 29 participants attending the mentoring sessions. To participate on this program, they had to submit an extended abstract, which was reviewed by the organizers before getting accepted. Each of the participants was mentored by one of the researchers. The mentors had the chance to bid on the mentees they preferred, based on the extended abstract submitted. The mentoring sessions happened in virtual sessions and each mentor was assigned at most to 2 mentees.

2.2 LaSSE application and participants

We opened a call for participants to select the school participants. To apply the candidates had to submit a short motivation statement presenting their research interests and reasons to attend the school and their resume. To be eligible to apply, it was necessary to work with Software Engineering topics, and be a PhD or MSc student from Latin American institutions or PhDs who received their degree on or after 2018 and work in Latin America.

The selected participants received registration for the school and for attending CBSOFT. In addition, in case the participant was an author of a paper on any event under CBSOFT, their paper fee

was waived. These benefits represented, for example, a 85 USD economy for graduate students who authored a paper.

To advertise the school in several countries, we reached out to Software Engineering researchers from 11 Latin American countries. We invited them to act as regional liaisons. Seven of them accepted to help, spreading the word in Mexico, Argentina, Paraguay, Peru, Colombia, Chile, and Costa Rica. We had versions of the call for participation in Portuguese, English, and Spanish, to make it easier to reach our audience. At the end, LaSSE accepted 162 applicants who met the criteria established. The participants were mostly from Brazil (144, or 89%) in addition to 10 participants from Argentina, 4 from Chile, 3 from Colombia, and 1 from Ecuador. Regarding their education level, 54 are MSc students, 91 are PhD students, and 17 are early faculty.

Finally, out of the 162 accepted candidates, 150 requested their CBSOFT registrations and 29 had paper fees waived via the School. These benefits were possible because of the support received from ACM SIGSOFT, which was key to the success of the school.

2.3 LaSSE feedback

Right after the last session of LaSSE, we administered a survey questionnaire to the attendees to get feedback from them. We ran two different surveys, one with all the attendees and one with those who participated in the mentorship program.

We received 84 answers from the general attendance (56%), and their feedback was very positive, as we can see in Figure 1. The highest number of neutral/negative answers was observed for the question about “collaboration with the participants during LaSSE” (the fourth from the top). The lack of specific networking activities in the program may explain this result. We also collected their perception of each talk (Figure 2). We omitted the talk title and researcher for ethical reasons. We can observe that all talks were very well evaluated, overall.

In addition to the Likert-scale questions, we asked the attendees about their general impressions. Most of the answers presented a positive tone, such as “*The experience was very good*” and “*The LatAm School was a great experience.*” We also got more specific feedback, pointing to the **importance of the topics**: “*the school addressed extremely important topics for our research (publications, reviews, jobs...)*”; “*Great topics, that helped me a lot.*”

In addition, some participants highlighted the **climate of the school** as a pro, like “*The interaction was fantastic...the distance between us (students) and the big names of the SE was reduced.*” **Motivation** was also a topic that came out of their answers: “*The school was very motivating and encouraging*”; “*I was feeling very inspired with motivational Keynotes...*” Finally, the participants expressed their **willingness to attend forthcoming editions**: “*I would like to participate in others editions, for sure!*”; “*This space needs to be part of the following CBSOFT editions because we learn a lot and receive free registration for CBSOFT.*”

Of course, there are opportunities to improve. Confirming the quantitative analysis, **lack of network opportunities** was mentioned (e.g., “*I would love having more space to connect with other participants*”). In addition, **more hands-on opportunities** (“*I wish we could have opportunities to put our hands on something*”) and longer sessions/event were mentioned (“*a longer duration so we can have longer talks*”; “*more days of immersion*”).

The second survey targeted only those attendees who had the

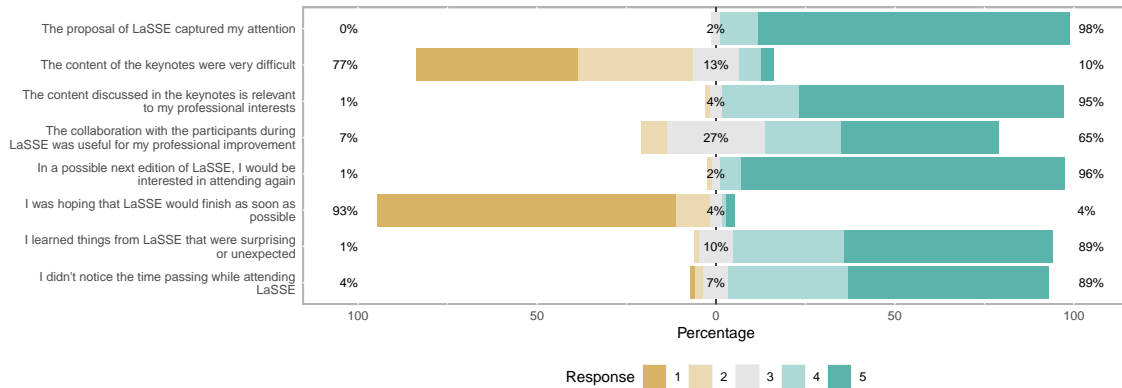


Figure 1: Feedback of LaSSE attendees about their perception of the school

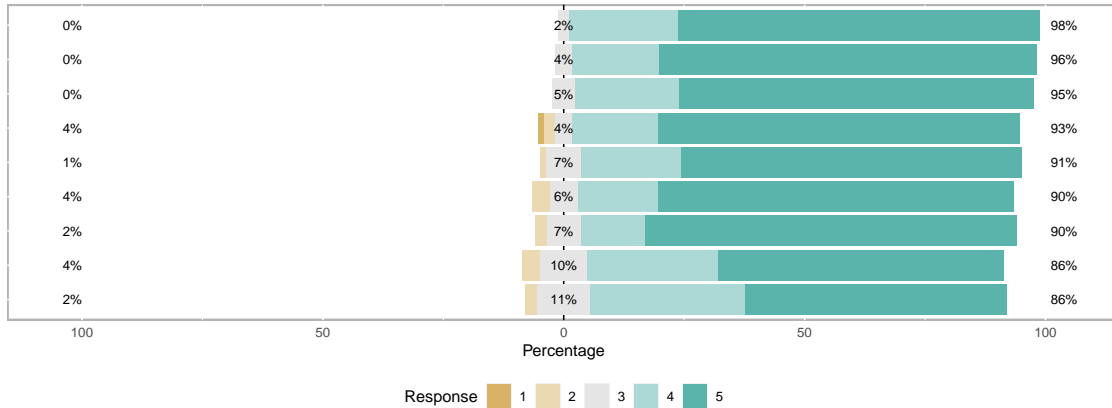


Figure 2: Feedback of LaSSE attendees about the talks

chance to participate in the mentoring program. The 22 answers received showed that the mentorship was a good program. As we can see in Figure 3 the participants considered it an enriching and positive experience.

Once again, we collected qualitative evidence that confirms the answers received in the Likert-scale questions. Here are some quotes that summarize the general feeling of the participants:

“It was a very enriching experience, and it opened the possibility of networking in the future. It also helped to practice my communication skills.”

“It was amazing to talk for the first time with someone else in English. Also, a researcher from another country has different and exciting points of view...the mentor was available for future meetings.”

“It was amusing, and since I just got my Ph.D. I received some very interesting feedback on where I can go next (and what I should not do)!”

“I received advice, constructive criticism, and the possibility to collaborate with her [the mentor] on a specific topic. ”

3. CBSOFT PROGRAM

The CBSOFT 2021 program comprised 7 keynotes, 1st LaSSE, more than 100 technical presentations (including research papers, industry papers, doctoral symposium, tool track) 4 workshops, and 3 tutorials. All symposia had the proceedings published by ACM via the ICPS program. The program was organized in 5 days. Each main symposia and the workshops had its program. CBSOFT 2021 was held virtually using multiple Zoom rooms. The number of parallel sessions ranged from 1 to 5.

3.1 SBES 2021

The program of the Brazilian Symposium on Software Engineering (SBES 2021) includes papers from the Research (20 full and 7 short papers), Insightful Ideas and Emerging Results (16 papers), Education (8 papers), and Tool (11 papers) tracks. All the 62 accepted papers had been presented in a technical session that mixed papers from different tracks. The program was organized in 11 thematic sessions: Mining Software Repositories, Code and Test Smells/Program Analysis, Product Lines/Maintenance and Evolution, SE Education, VV & Testing, Configuration management, and deployment/Quality, Requirements/Modeling, Experimental Software Engineering, Human Social Aspects, Technical Debt, Architecture/Modularity/Blockchain. The program also had 3 outstanding keynote speakers.

SBES opening keynote was addressed by Andreas Zeller. Dr. Zeller is a faculty member at the CISPA Helmholtz Center for Information Security and a professor of Software Engineering at Saarland University, Germany. His keynote, entitled “Illustrated Code: Building Software that Lasts,” discussed how notebooks serve for exploring and explaining code and data and how they can be used as software modules, integrating self-checking documentation, tests, and tutorials all in one place.

The second keynote was addressed by Dr. Gabriele Bavota (Associate Professor at the Faculty of Informatics of the Università della Svizzera Italiana). The keynote was entitled “Automating Code-Related Tasks: Challenges and Lessons Learned” and focused on evaluating source code generation/recommendation and code review automation approaches. He also discussed the extent to which the proposed approaches can support developers.

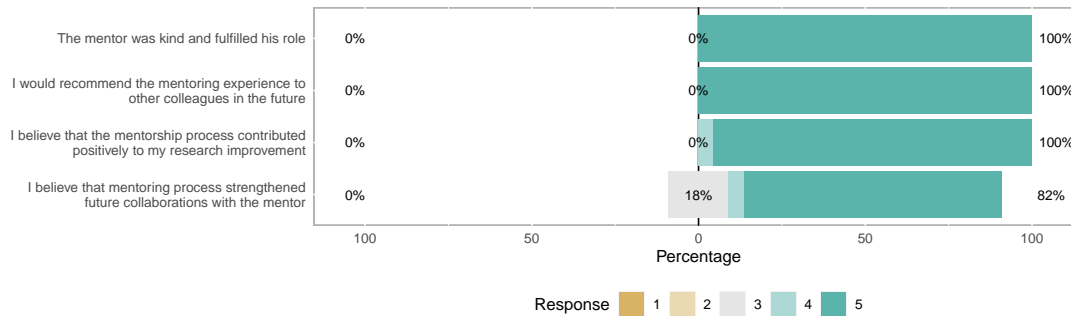


Figure 3: Feedback of LaSSE attendees who received mentorship

Dr. Cecília Rubira, Full Professor of the Institute of Computing at State University of Campinas, Brazil, tackled the topic “Challenges in Providing Resilience in Self-Adaptive Systems.” In her talk, she presented a retrospective of the work she has been conducting on dynamic variability in dynamic software product line solutions. She also covered more recent work focusing on automated plan generation and execution under uncertainty.

3.2 SBLP 2021

The 25th Brazilian Symposium on Programming Languages (SBLP 2021) program was composed of 14 high-quality papers organized in 5 thematic sessions: Compilers and Domain-Specific Languages, Compiler Optimizations, Concurrent and Distributed Computing, Types, and Programming Architectures and Models. The program was completed with two remarkable keynote talks, presented by Professor Alexandra Silva from Cornell University and University College London, United Kingdom, and Professor Roberto Bigonha from the Federal University of Minas Gerais, Brazil.

Alexandra Silva addressed the opening keynote of SBLP 2021. Dr. Alexandra Silva is a Professor in the Computer Science Department at Cornell University. In her talk about “Black-Box Analysis of Network Protocol Implementations,” she presented Prognosis, a framework offering automated black-box learning and analysis of models of network protocol implementations.

SBLP 2021 also counted with the keynote by Dr. Roberto Bigonha, from the Federal University of Minas Gerais (UFMG), Brazil. His keynote, “What will be the next programming language?” intended to highlight the most relevant advances in the design of programming language constructs and their associated attempts to model important software development demands.

3.3 SBCARS 2021

SBCARS program was composed of 11 papers, organized into three technical sessions with excellent paper presentations. The papers covered a wide range of the symposium-specific topics, such as software product lines, software architecture, refactoring, and empirical studies on software engineering.

SBCARS program had a keynote by Dr. David Lo (Singapore Management University), who researches the intersection of software engineering, AI, and cybersecurity. His keynote brings insights from his experience using AI to automatically find and fix bugs, an exciting research area on which program repair relies.

Rafael Ponte—a Software Engineer at Zup Innovation with 16+ years of experience as a developer—discussed how it is possible to scale web systems without getting carried away by the hype, starting from simpler and cheaper practices to more far-fetched that require a greater investment.

3.4 SAST 2021

In the 2021 edition, the 6th Brazilian Symposium on Systematic Automated Software Testing program was composed of seven full papers. The papers cover several exciting topics regarding software testing for various paradigms. The program was organized in 3 technical sessions, focusing on discussions and interaction.

Dr. Myra B. Cohen addressed the SAST opening keynote. Dr. Cohen is a Professor and the Lanh and Oanh Nguyen Chair in Software Engineering in the Department of Computer Science at Iowa State University. She talked about “The Evolution of Search-based Software Testing”, introducing the current landscape of Search-Based Software Testing (SBST) foundations and highlighting some key points of its evolution. She wrapped up with insights and thoughts on future directions for SBST.

Dr. Otavio Lemos addressed the second keynote at SAST. Dr. Lemos is a developer, researcher, and Professor at the Federal University of São Paulo (UNIFESP). In his talk—“Revisiting test types”—he presented a more pragmatic definition of unit test, integration test, and end2end from a practical perspective. He also discusses how these tests can be used effectively in a continuous integration and delivery (CI/CD) pipeline.

4. CONCLUDING REMARKS AND FUTURE

CBSOFT 2021 was a great event with a comprehensive program and keynote speakers. The introduction of the Latin American School of Software Engineering enlightened this edition, bringing more than 150 students and early faculty onboard.

Organizing and making this edition financially feasible was a big challenge due to COVID and the economic moment that Brazil is going through. The support of ACM SIGSOFT was crucial to the event, helping students be trained and participate in the school—enabling the organization to support their participation on CBSOFT—and helping with the costs for running the conference.

For future editions, we will keep our efforts on training and empowering the new generation of Latin American researchers. The second edition of LaSSE is already being planned. We will consider the feedback received, creating more opportunities for networking and hands-on experience opportunities. An in-person event would make these points easier, so we look for a brighter future where we can meet people in person again. For CBSOFT, we plan to keep the community around these four events, creating a stronger program for the following editions.

Acknowledgments We thank ACM’s support, which made CBSOFT and LaSSE possible. We also thank all the organizing committee and program committee members who made this CBSOFT possible. Lastly, we thank all speakers and mentors who voluntarily contributed to the success of LaSSE and CBSOFT.