

Preface to the CLEI 2023 Special Issue

Volume I

The present issue of CLEIej is devoted to extended and revised papers of selected works presented at the XLVIX Latin American Computing Conference (CLEI 2023), held at the Universidad Mayor de San Andrés - La Paz, Bolivia, from the 16th to the 21st of October, 2023.

The CLEI 2023 conference included 4 tracks on different computer science and informatics areas, 6 associated events, the second edition of ELI (Latin-American School in Informatics), 3 local events, and the Journal First track.

The following CLEI 2023 tracks focused on the state-of-the-art in different fields: Computer Technology, Intelligent Systems, Software Systems, and Systems In Practice.

The associated events organized within CLEI 2023 follow next:

- XIII Latin American Congress of Women in Computing (LAWCC).
- XII Latin-American Symposium on Dependable and Secure Computing (LADC).
- XXX Latin American Contest of Master's Thesis (CLTM).
- IX Latin American Contest of Doctoral Thesis (CLTD).
- I Workshop on Cybersecurity in Latin America and the Caribbean
- Bolivian Computer Science Congress (CCBOL)

CLEI 2023 received a total of 166 submissions across its main research tracks, comprising 123 full papers and 43 short work-in-progress papers. From these submissions, 55 papers were accepted for publication, resulting in an acceptance rate of 33%. Additionally, one journal-first paper was submitted and accepted for presentation at the conference only. LAWCC accepted 21 submissions, and six finalist postgraduate theses were presented at CLTM and CLTD. Each submission underwent review by a minimum of three Program Committee members from the respective tracks, totaling 645 reviews conducted by 247 reviewers.

The authors of the top 17 papers from the four research tracks, based on their evaluations by the Track Chairs, were invited to extend their work and submit it to a special issue of CLEIej. Of these, 11 papers were extended and submitted, and went through another detailed review process with invited reviewers from CLEI 2023 and the wider academic community, which resulted in 5 papers being accepted for final publication in this first volume. A second volume will be published later with the remaining selected papers.

In the following paragraphs, the articles of this first volume are presented in order of publication:

“Explainability Analysis of the Evaluation Model of the Level of Digital Transformation in MSMEs based on Fuzzy Cognitive Maps”: This contribution introduces a framework utilizing Fuzzy Cognitive Maps (FCMs) to evaluate digital transformation levels in Micro, Small, and Medium Enterprises (MSMEs). Its key contribution lies in enhancing model interpretability through explainability analysis methods like Weight-Filter FCM and feature importance analysis. By elucidating causal relationships within the digital transformation process, the paper aims to provide valuable insights for strategic decision-making and organizational advancement in MSMEs.

“On the Measurement of io_uring Performance: a Strategy and Experience in the Envoy Service Mesh”: This article reports on an empirical study on the performance of the io_uring interface in the Envoy service mesh. Through rigorous experimentation, the article provides evidence of performance improvements of the service mesh in terms of latency and bandwidth which the authors use to advocate for the adoption of io_uring in the distributed systems domain.

“The JavaScript Package Selection Task: A Comparative Experiment Using an LLM-based Approach”: This article extends a former contribution that was awarded a Best Paper Award at CLEI 2023. The authors investigate the use of a recommender system called AIDT enhanced with a Retrieval Augmented Generation (RAG) architecture in combination with the Large Language Model (LLM) ChatGPT for the task of

recommending suitable JavaScript packages to software developers. This work showcases the exciting capabilities of rapidly-evolving LLMs in helping developers explore technology repositories more efficiently.

“Simulation-based Reinforcement and Imitation Learning for Autonomous Sailboat Navigation in Variable Environmental Conditions”: This work presents an adaptive control system for autonomous sailboats using reinforcement and imitation learning for efficient navigation in diverse environmental conditions, focusing on oceanographic data acquisition. Key contributions include a novel approach mimicking human decision-making, simulation-based training to overcome data scarcity, and advancements in computational methods for studying climate change impacts on marine ecosystems. This study offers a promising solution for enhancing sailboat navigation and advancing oceanic research in response to evolving environmental dynamics.

“Beyond Security: Understanding the Multiple Impacts of Security Smells for Microservices”: This article explores the broader implications of security smells and refactorings in microservice-based applications. Through thematic analysis and an online survey involving practitioners and researchers, the study identifies 35 validated impacts on maintainability, performance efficiency, and adherence to key design principles. Additionally, the paper presents these impacts visually using Softgoal Interdependency Graphs (SIGs), offering a comprehensive perspective on the effects of security smells and refactorings in the microservices domain.

We extend our heartfelt gratitude to all the CLEI 2023 Track Chairs, who collaborated with us throughout the paper reviewing process and played a crucial role in evaluating and selecting the 17 best papers invited to extend their work for this special issue.

We also wish to express our sincere appreciation to the reviewers who generously volunteered their time and expertise to evaluate the content and quality of the papers included in this special issue.

Lastly, we thank all the authors for accepting our invitation to expand and revise their conference submissions, enhancing their papers with the reviewers' feedback to produce these high-quality extended versions of their work.

We hope you find this special issue as enriching and enjoyable as we do, as it contributes to the dissemination of important research from our Latin American community.

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CLEIej Guest Editors for CLEI 2023 Special Issue