
EDITORIAL

ERBASE Immersive and Generative Realities

It is with great pleasure that we present this special edition of the *Journal of Bioengineering, Technologies and Health* (JBTH), dedicated to the best papers presented at ERBASE 2024, which focused on the theme "*Immersive and Generative Realities*." The event was held in Salvador, Brazil, from November 5 to 8, 2024.

The *Regional School of Computing Bahia-Alagoas-Sergipe* (ERBASE) is an annual event promoted by the *Brazilian Computer Society* (SBC). It has a long-standing tradition of bringing together students, researchers, and professionals in the field to engage in activities that present and discuss the most current and relevant topics in Computing today. In its 24th edition, ERBASE 2024 provided a valuable showcase of the research and development produced by the Computing community in the Bahia-Alagoas-Sergipe region.

The event was organized by the *Federal University of Bahia* (UFBA, Camaçari Campus), SENAI CIMATEC University Center, and the *State University of Bahia* (UNEB). This year, ERBASE returned to Salvador as a well-established event, integrating federal public universities (such as UFBA, UFAL, UFS, UFRB, UNIVASF, UFOB, and UFSB, among others), state universities (such as UNEB, UESC, UEFS, and UESB), and private institutions (such as UNIFACS and the *Catholic University of Salvador*). It also included a broad network of *Federal Institutes* (offering both higher education and technical education), researchers of various levels (PhD holders, master's graduates, and undergraduate students), market professionals, professors, students, entrepreneurs, and public sector representatives. Additionally, ERBASE 2024 fostered collaboration between different areas of Computing and other fields, such as Education, Health, and Industry, while strengthening connections between the micro-regions of Bahia and the neighboring states of Alagoas and Sergipe.

ERBASE 2024 was centered on the theme "*Immersive and Generative Realities*," offering an in-depth analysis of the significance, impact, and scientific, economic, and social implications of Immersive Technologies and Generative Artificial Intelligence. The event aimed to highlight the specific impact of these technologies in the Bahia-Alagoas-Sergipe region while considering national and international contexts.

The convergence of *virtual, augmented, and mixed reality* with algorithmically generated systems—such as generative models for text and image creation—is profoundly reshaping how we interact with the digital world. This transformation is driving innovation in fields such as education, industry, culture, and entertainment, paving the way for new forms of creativity, communication, and learning. The event emerged as a response to the growing need for a qualified space for knowledge exchange, critical debate, and the formation of collaborative networks across institutions and academic disciplines.

We live in an era where immersive and generative technologies are becoming increasingly integrated into our daily lives, enhancing interactions and optimizing how we work, learn, and create. As paradigms shift at an accelerated pace, it is crucial for the Computing community within the regional innovation ecosystem to engage in a critical and strategic discussion about these technologies, strengthening both the academic and industry sectors.

Immersive realities, such as virtual and augmented reality, offer new layers of perception, expanding the boundaries of human experience. They enable the exploration of simulated environments with a high degree of presence, interactivity, and engagement. These technologies have proven valuable in professional training and the development of safer, more sustainable, and more inclusive industrial solutions. Beyond being a technical advancement, immersion is redefining practices in education, content creation, and production.

On the other hand, generative technologies, driven by artificial intelligence, are establishing a new creative paradigm. By enabling the automatic generation of text, images, sounds, and virtual environments, these tools push the boundaries of computational expressiveness. When combined with immersive technologies, they facilitate the creation of highly responsive, adaptable, and often unprecedented digital worlds.

This intersection between immersive and generative technologies also raises important ethical concerns. How can we ensure the authenticity of digital experiences? How can we mitigate algorithmic biases in content generation? What are the social impacts of these technologies on memory, identity, and reality construction? Addressing these questions requires a multidisciplinary approach, one that is sensitive to human dimensions and committed to principles of inclusion, diversity, and sustainability.

Over four days, emerging trends such as *Artificial Intelligence, Cloud Computing, Cybersecurity, Virtual and Augmented Reality, and the Internet of Things* were explored through national keynote lectures, panel discussions, hands-on workshops, parallel events (including workshops on Digital

Games, Computing in Education, Assistive Technology, and others), and interactive activities such as robotics and programming marathons and hackathons.

The *Organizing Committee* of ERBASE 2024 ensured a comprehensive event focused on professional development and continuing education, addressing the challenges and opportunities shaping the field of Computing. The event fostered connections between key stakeholders in the regional innovation ecosystem, including representatives from academia, industry, and government. Researchers, students, professionals, and policymakers took advantage of this platform to exchange knowledge, showcase research findings and products, and strengthen their professional networks.

ERBASE 2024 saw strong engagement from the regional community, with research contributions from groups and scholars across different parts of Brazil. A total of 96 papers were submitted to the event's workshops (*PesqBASE*, *WEIBASE*, *XBASE*, and *Meninas Digitais*). These papers underwent a rigorous blind review process, with a minimum of two reviewers per submission, leading to the selection of the best research for presentation at the event and publication in the conference proceedings.

In this context, the papers selected for publication in this special issue explore innovative solutions in the fields of *immersive realities*, *artificial intelligence*, and *educational technologies*. The research topics covered include:

- Safe route planning for collaborative robots using the *Seam Carving* technique;
- Development of low-cost IoT-based electronic access control systems;
- Creation of affordable *Virtual Reality* hardware focused on inclusion;
- Application of active learning methods for mobile app development with *Django* and *Flutter*;
- Optimization strategies for *automated trading* systems using reinforcement learning;
- Standardization of educational materials with *Marp* and *CI/CD* workflows;
- Initiatives aimed at empowering women in immersive technologies, such as "*ICT & Elas*" and "*Elas nas Exatas*", which promote training, inclusion, and representation in STEM and computing fields.

These topics reflect the transformative potential of immersive and generative technologies when applied in an ethical, accessible, and socially responsible manner.

We believe that this publication will serve as an important reference for those seeking to understand and follow the technical, scientific, and social developments in immersive and generative realities. We wish all readers an engaging, critical, and inspiring reading experience!

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