4th International Computer Programming Education Conference

ICPEC 2023, June 26–28, 2023, Vila do Conde, Portugal

Edited by

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Preface

As the world continues its rapid technological evolution, the role of computer programming education has become increasingly pivotal in shaping the future of our societies. The landscape of computer programming education is undergoing profound changes driven by advancements in technology, shifts in pedagogical approaches, and the growing demand for digital skills. As educators, researchers, and practitioners, we find ourselves confronted with new challenges and opportunities that call for a deep exploration of generative tools and their potential to revolutionize the teaching and learning of computer programming.

In this edition of ICPEC, we are excited to delve into a theme that not only reflects the current state of the field but also guides its future trajectory: "Generative Tools and the Future of Teaching-Learning in Computer Programming."

Generative tools encompass a diverse array of technologies, from code generation frameworks to interactive development environments and automated assessment systems. These tools hold the promise of enhancing both the efficiency and effectiveness of programming education. With their ability to produce code, offer instant feedback, and facilitate collaborative learning, generative tools can empower students and educators alike to engage with programming concepts more deeply and creatively.

However, we must also confront a series of complex questions and challenges:

- How do generative tools impact students' problem-solving skills and their understanding of fundamental programming concepts?
- What are the ethical considerations surrounding the use of automated assessment systems and code generation tools in educational contexts?
- How can educators best integrate generative tools into their curricula to promote a balanced approach between automation and conceptual mastery?
- What new paradigms of teaching and learning emerge as a result of incorporating generative tools, and how do these paradigms reshape the traditional classroom dynamics?

In addition to generative tools, this edition of ICPEC also highlights new trends, paradigms, and tools that are redefining the landscape of computer programming education. From the rise of interdisciplinary approaches that bridge programming with other fields, to the exploration of alternative programming paradigms and languages, we will explore the rich tapestry of possibilities that lie ahead.

We extend our deepest gratitude to the dedicated individuals who have contributed to making ICPEC 2023 a reality, from the organizing committee to the presenters and attendees. Your passion and commitment are the driving forces behind the success of this conference.

Ricardo Alexandre Peixoto de Queirós
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