Editorial

The continued advancement of digital technologies, artificial intelligence, and education-support systems has paved the way for innovative research that bridges theoretical insight and practical implementation. This issue presents a collection of compelling studies that highlight novel approaches to challenges in software engineering, AI transparency, classroom education, and hardware security. The diversity of contributions reflects a shared commitment to usability, ethical compliance, and technological resilience—values that are increasingly important in today's interconnected and rapidly evolving research environment.

Addressing the chronic problem of inefficient and incomplete bug reporting in self-hosted systems, a lightweight framework named *Watson* is introduced to enhance developer workflows. By capturing user interactions, screen recordings, and network activity, Watson minimizes the user's effort during the reporting process while significantly increasing the quality of reports. Its seamless integration with issue trackers, without relying on cloud services or external APIs, makes it ideal for confidentiality-sensitive environments. Experimental evaluations show that Watson triples the efficiency in identifying root causes of bugs compared to traditional manual reporting, suggesting a promising direction for modernizing software maintenance tools [1].

Explainable Artificial Intelligence (XAI) remains a cornerstone in the development of transparent and accountable AI systems. A comprehensive exploration of XAI concepts reveals the nuanced difference between explainability and interpretability, while shedding light on cutting-edge techniques like feature attribution and rule extraction from neural networks. The discussion extends to the regulatory landscape, emphasizing the urgent need for governance structures that can evolve in tandem with rapid AI developments. The work not only advances academic discourse on AI ethics but also proposes pragmatic considerations for policy and research in high-stakes domains such as finance and healthcare [2].

Innovations in programming education are also represented in this volume, with the development of a classroom support system that complements tangible educational tools. Designed for real-time monitoring of student progress, the system helps instructors identify common learning barriers and deliver timely, tailored guidance. Deployed in a high school setting, the tool was well-received by both teachers and students, who appreciated its ability to personalize the learning experience. While limitations remain in the rigidity of predefined model answers, this system marks a significant step toward scalable and data-informed teaching practices in computer science education [3].

In the domain of hardware-based security, a novel approach to true random number generation is presented using Resistive Switching Random Access Memories (ReRAMs). By comparing the high-resistance states of two ReRAM devices, the design avoids the precision timing constraints found in other TRNGs. Fully compatible with existing ReRAM crossbar architectures, the generator passed the NIST randomness test suite, validating its performance. Moreover, the analysis of device-to-device variability offers insight into the robustness of this approach, paving the way for secure and efficient random number generation in hardware cryptographic systems [4].

Collectively, these studies illustrate the breadth and depth of modern research efforts aimed at improving system reliability, user-centered design, educational innovation, and digital trust. By tackling domain-specific problems with interdisciplinary solutions, these contributions move us closer to a more intelligent, secure, and equitable technological future.

References:

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Editor-in-chief

Prof. Passerini Kazmersk