Special Issue

Artificial Intelligence Hardware and Software Co-Design and Neuromorphic Computing

Message from the Guest Editors

This Special Issue explores the evolving landscape of artificial intelligence (AI) through co-design methodologies integrating hardware and software. As AI workloads grow complex and data-intensive, efficient, scalable, and domain-adapted computing paradigms are urgently needed. Traditional hardware–software interactions are inadequate for next-generation AI, from edge intelligence and autonomous systems to large-scale generative models. The focus is on (a) collaborative design of hardware and software for performance, energy efficiency, and adaptability; (b) emerging paradigms such as neuromorphic computing, inspired by the human brain; and (c) interdisciplinary research bridging architecture, algorithms, circuits, and systems. This Special Issue highlights advances in AI accelerators, compiler/runtime support, spiking neural networks, memory-centric designs, and encourages discussion on benchmarking, design automation, and co-optimization strategies. It will be a timely resource for researchers and practitioners in the co-evolution of AI hardware and software and in developing novel computing architectures for intelligent systems.

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