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Random Access Memory (RAM): Circuits and Applications

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Message from the Guest Editors

RRAM is one of the standout candidates among the emerging memory technologies that has the potential to replace current devices for high-performance computing and digital/analog circuit applications. In fact, the application fields of RRAM go far beyond its initial use as memory devices. Its non-volatility properties and multilevel storage capability (MLC) make RRAM well suited for in-memory computing (IMC). Furthermore, it can serve as synaptic elements in neural networks for its ability to tune their resistance. These two approaches are expected to overcome the limitations imposed by the separation of CPU and memory, causing the 'von Neumann bottleneck' and 'memory wall' problem.

Although RRAM reports excellent properties in terms of its simple metal–insulator–metal (MIM) structure, easy compatibility with current CMOS technology, outstanding scalability, fast switching speed, and long data retention, there are still some problems related to controllability, variability, and endurance which may limit its extensive application. This Special Issue invites submissions devoted to overcoming such limitations and developing RRAM-based applications.

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Message from the Editor-in-Chief

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