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Memristors for Neuromorphic Circuits and Artificial Intelligence Applications

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Message from the Guest Editor

Dear Colleagues,

Artifial Intelligence (AI) is a pervasive technology usually implemented in software. However, the solid-state nanoelectronic implementation of the memristor (for the first time in 2008 by the HP group led by Dr. Stanley Williams), a device predicted by Prof. Leon Chua in 1971 using symmetry arguments, opens up a new frontier for AI: the so-called Deep learning ICs. Less-known by the general public, these hardware-based neuromorphic systems will allow distributed energy-efficient deployment of AI in many areas requiring real-time response, intelligent decision and fast action. In this Special Issue we will try to give a general overview of this new technology and review the concepts of machine learning and deep learning, focused on applications. We will cover the state-of-the-art technological implementation of the memristor as an electron device with particular emphasis on resistive devices such as ReRAM and PCM. We will also present the actual state-of-the-art of memristor-based deep learning prototypes for different applications. Finally, we will dedicate a few papers to ethical issues related to AI.

Prof. Dr. Jordi Suñé
Guest Editor

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Message from the Editor-in-Chief

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