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A biasing method for programming of nonlinear memristor-based neural network

Hyongsuk Kim
Chonbuk National University, Republic of Korea

A biasing method for programming of nonlinear memristor-based neural networks is addressed in this paper. Weights of neural networks are designed based on Memristor Bridge Synapse. Despite many significant benefits of the memristor bridge synapse, there is one critical weakness that programming at its extreme (max or min) states is nonlinear due to boundary effects of memristors, which is common in most of nano-devices. It is an important issue when a neural network is to be programmed or a learned neural network is to be reproduced for multiple copies. In this study, a novel architecture of a modified memristor bridge synapse is also proposed. In the modified architecture of the Memristor Bridge Synapse in which two switches are added for initialization and programming of the synapse, the boundary effect issue is avoided by biasing the Programming Origin to the middle of linear region.

Speaker Biography

Hyongsuk Kim completed his Ph.D. from University of Missouri, Columbia, USA. and his area of research interest is Memristor theory and applications, Vision-based robot navigation and Vision-based defect detection on object surfaces. Presently he is working as a professor in Chonbuk National University, Republic of Korea.

e: hskim@jbnu.ac.kr

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