Abstracts

Neuromodeling of microwave circuits exploiting space-mapping technology

J.W. Bandler, M.A. Ismail, J.E. Rayas-Sanchez and Qi-Jun Zhang. "Neuromodeling of microwave circuits exploiting space-mapping technology." 1999 Transactions on Microwave Theory and Techniques 47.12 (Dec. 1999 [T-MTT] (Special Issue on 1999 International Microwave Symposium)): 2417-2427.

For the first time, we present modeling of microwave circuits using artificial neural networks (ANN's) based on space-mapping (SM) technology, SM-based neuromodels decrease the cost of training, improve generalization ability, and reduce the complexity of the ANN topology with respect to the classical neuromodeling approach. Five creative techniques are proposed to generate SM-based neuromodels. A frequency-sensitive neuromapping is applied to overcome the limitations of empirical models developed under quasi-static conditions, Huber optimization is used to train the ANN's. We contrast SM-based neuromodeling with the classical neuromodeling approach as well as with other state-of-the-art neuromodeling techniques. The SM-based neuromodeling techniques are illustrated by a microstrip bend and a high-temperature superconducting filter.

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