Abstracts

A robust algorithm for automatic development of neural network models for microwave applications (2001 Vol. III [MWSYM])

V. Devabhaktuni, M.C.E. Yagoub and Qi-Jun Zhang. "A robust algorithm for automatic development of neural network models for microwave applications (2001 Vol. III [MWSYM])." 2001 MTT-S International Microwave Symposium Digest 01.3 (2001 Vol. III [MWSYM]): 2087-2090 vol.3.

In this paper, we propose a robust algorithm for automating the neural network based RF/Microwave model development process. The algorithm can build a neural model starting with zero amount of training/test data, and then proceeding with neural network training in a stage-wise manner. In each stage, the algorithm utilizes neural network error criteria to determine additional training/test samples required and their location in model input space. The algorithm dynamically generates these new data samples during training, by automatic driving of simulation tools, e.g., OSA90, Ansoft-HFSS. Initially, fewer hidden neurons are used, and the algorithm adjusts the neural network size whenever it detects under-learning. Our technique integrates all the sub-tasks involved in neural modeling, thereby facilitating a more efficient and automated model building process. It significantly reduces the intensive human effort demanded by the conventional step-by-step neural modeling approach. The algorithm is demonstrated through MESFET and Embedded Capacitor examples.

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