Abstracts

Neural-based dynamic modeling of nonlinear microwave circuits (Dec. 2002 [T-MTT])

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A neural network formulation for modeling nonlinear microwave circuits is achieved in the most desirable format, i.e., continuous time-domain dynamic system format. The proposed dynamic neural network (DNN) model can be developed directly from input-output data without having to rely on internal details of the circuit. An algorithm is developed to train the model with time or frequency domain information. Efficient representations of the model are proposed for convenient incorporation of the DNN into high-level circuit simulation. Compared to existing neural-based methods, the DNN retains or enhances the neural modeling speed and accuracy capabilities, and provides additional flexibility in handling diverse needs of nonlinear microwave simulation, e.g., time- and frequency-domain applications, single-tone and multitone simulations. Examples of dynamic modeling of amplifiers, mixer, and their use in system simulation are presented.

❑ Return to main document.