Abstracts

A Neural Network Modeling Approach to Circuit Optimization and Statistical Design

The trend of using accurate models such as physics-based FET models, coupled with the demand for yield optimization results in a computationally challenging task. This paper presents a new approach to microwave circuit optimization and statistical design featuring neural network models at either device or circuit levels. At the device level, the neural network represents a physics-oriented FET model yet without the need to solve device physics equations repeatedly during optimization. At the circuit level, the neural network speeds up optimization by replacing repeated circuit simulations. This method is faster than direct optimization of original device and circuit models. Compared to existing polynomial or table look-up models used in analysis and optimization, the proposed approach has the capability to handle high-dimensional and highly nonlinear problems.

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