Abstracts

Current Trends in Network Optimization

J.W. Bandler and R.E. Seviora. "Current Trends in Network Optimization." 1970 Transactions on Microwave Theory and Techniques 18.12 (Dec. 1970 [T-MTT] (1970 Symposium Issue)): 1159-1170.

Some current trends in automated network design optimization which, it is believed, will play a significant role in the computer-aided design of lumped-distributed and microwave networks are reviewed and discussed. In particular, the adjoint network approach due to Director and Rohrer for evaluating the gradient vector of suitable objective functions related to network responses that are to be opttilzed is presented in a tutorial manner. The advantage of this method is the ease with which the required partial derivatives with respect to variable parameters, such as electrical quantities or geometrical dimensions, can be obtained using at most two network analyses. Least pth and minimax approximation in the frequency domain are considered. Networks consisting of linear time-invariant elements are treated, including the conventional lumped elements, transmission lines, RC limes, coaxial lines, rectangular waveguides, and coupled lines. To illustrate the application of the adjoint network method, an example is given concerning the optimization in the least pth sense using the Fletcher-Powell method of a transmission-line filter with frequency variable terminations previously considered by Carlin and Gupta.

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