Abstracts

Huber Optimization of Circuits: A Robust Approach

J.W. Bandler, S.H. Chen, R.M. Biernacki, L. Gao, K. Madsen and H. Yu. "Huber Optimization of Circuits: A Robust Approach." 1993 Transactions on Microwave Theory and Techniques 41.11 (Dec. 1993 [T-MTT] (1993 Symposium Issue)): 2279-2287.

We introduce a novel approach to "robustizing" circuit optimization using Huber functions: both two-sided and one-sided. Advantages of the Huber functions for optimization in the presence of faults, large and small measurement errors, bad starting points, and statistical uncertainties are described. In this context, comparisons are made with optimization using l/sub 1/, l/sub 2/ and minimax objective functions. The gradients and Hessians of the Huber objective functions are formulated. We contribute a dedicated, efficient algorithm for Huber optimization and show, by comparison, that generic optimization methods are not adequate for Huber optimization. A wide range of significant applications is illustrated, including FET statistical modeling, multiplexer optimization, analog fault location, and data fitting. The Huber concept, with its simplicity and far-reaching applicability, will have a profound impact on analog circuit CAD.

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