Optimal Excitation Signal Design for Frequency Domain System Identification Using Semidefinite Programming

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The paper discusses two methods of optimal excitation signal design for identification with Maximum Likelihood parameter estimation: The 'classical', dispersion function based method, and a new, semidefinite programming based one. It is shown that the dispersion function based algorithm is a primal-dual method. The problem can be formulated as matrix determinant maximization subject to linear matrix inequalities. We introduce an interior point method for excitation signal design. The implementations of the two methods are compared in practical use. For general problems, the semidefinite programming based approach performs better, while for practical optimal excitation signal design, the dispersion function based one is recommended.