

Likelihood Bounds for Constrained Estimation with Uncertainty

S. Samar, D. Gorinevsky, and S. Boyd

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This paper addresses the problem of finding bounds on the optimal maximum a posteriori (or maximum likelihood) estimate in a linear model under the presence of model uncertainty. We introduce the novel concepts of at least as likely as the maximum a posteriori (ALAMAP) estimate, or at least as likely as the maximum likelihood (ALAML) estimate. The concept is formulated as a convex optimization problem. We specifically make use of second-order cone programming (SOCP) techniques to compute the likelihood bounds in an efficient manner. The procedure of computing the bounds is illustrated by examples in state estimation (smoothing/filtering), and in system identification.

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