

Abstract Submitted
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Data-driven sensor selection method using ADMM for a large-scale problem¹ TAKAYUKI NAGATA, NONOMURA TAKU, KUMI NAKAI, KEIGO YAMADA, YUJI SAITO, Tohoku University, SHUNSUKE ONO, Tokyo Institute of Technology — The present study proposes a sensor selection method based on the sparsity-promoting framework with the A-optimality criterion and the alternating direction method of multipliers algorithm. The performance of the proposed method was evaluated with a random sensor problem and compared with the previously proposed methods such as the greedy method and the convex relaxation. The performance of the proposed method was better than the existing method in terms of the trace of the inverse of the Fisher information matrix. The computational complexity of the proposed method is the first order of the size of the problem (n) and the square order of the number of latent state variables (r). In the case of the convex approximation, the computational complexity is cubic orders of the size of the problem. The Considered problem in the present study is $r \ll n$, and thus the computational cost of the proposed method is quite smaller than that of the convex relaxation. The proposed method was applied to the data-driven sparse-sensor-selection problem. A data set adopted is the NOAA OISST V2 mean sea surface temperature set. At the number of sensors larger than that of the latent state variables, the proposed method showed better performance compared to previously proposed methods in terms of the trace of the inverse of the Fisher information matrix and reconstruction error.

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