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Group sparse RLS algorithms. (English) Zbl 1334.93188

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Summary: Group sparsity is one of the important signal priors for regularization of inverse problems. Sparsity with group structure is encountered in numerous applications. However, despite the abundance of sparsity-based adaptive algorithms, attempts at group sparse adaptive methods are very scarce. In this paper, we introduce novel recursive least squares (RLS) adaptive algorithms regularized via penalty functions, which promote group sparsity. We present a new analytic approximation for $\ell_{p,0}$ norm to utilize it as a group sparse regularizer. Simulation results confirm the improved performance of the new group sparse algorithms over regular and sparse RLS algorithms when group sparse structure is present.

MSC:

[93E24](#) Least squares and related methods for stochastic control systems
[93E11](#) Filtering in stochastic control theory
[93C40](#) Adaptive control/observation systems
[93B30](#) System identification

Cited in **3** Documents

Keywords:

[adaptive filter](#); [RLS](#); [sparsity](#); [group sparsity](#); [block structure](#); [mixed norm](#)

Full Text: [DOI](#)