

# Estimation of sparse directed acyclic graphs through a lasso framework

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Causal networks are conveniently presented by directed acyclic graphs (DAGs). To estimate DAGs from high dimensional data is challenging due to the large number of possible spaces of DAGs, the acyclicity constraint of the structures, the typically nonconvex objective functions, and the problem of equivalent classes from observational data. In this talk, we present an efficient Lasso (cLasso) algorithm to estimate sparse DAGs under  $L_1$ -penalized likelihood objective function with the acyclicity constraint. Simulations and real data examples are presented to demonstrate the efficiency and flexibility of the proposed method.