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On polyhedral approximations of polytopes for learning Bayes nets

Milan Studeny, David Haws

We review three vector encodings of Bayesian network structures. The first one has recently been applied by Jaakkola 2010, the other two use special integral vectors formerly introduced, called imsets [Studeny 2005, Studeny 2010]. The central topic is the comparison of outer polyhedral approximations of the corresponding polytopes. We show how to transform the inequalities suggested by Jaakkola et al. to the framework of imsets. The result of our comparison is the observation that the implicit polyhedral approximation of the standard imset polytope suggested in [Studeny 2011] gives a closer approximation than the (transformed) explicit polyhedral approximation from [Jaakkola 2010]. Finally, we confirm a conjecture from [Studeny 2011] that the above-mentioned implicit polyhedral approximation of the standard imset polytope is an LP relaxation of the polytope.

Submission history

Which authors of this paper are endorsers?