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# An integer programming approach for the hyper-rectangular clustering problem with axis-parallel clusters and outliers

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## Abstract

We present a mixed integer programming formulation for the problem of clustering a set of points in the  $d$ -dimensional space with axis-parallel clusters, while allowing to discard a pre-specified number of points, thus declared to be outliers. We identify a family of valid inequalities separable in polynomial time, we prove that some of them induce facets of the associated polytope, and we show that the dynamic addition of cuts coming from this family is effective in practice.

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