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Approximation Algorithms for Maximum Independent Set of Pseudo-Disks

We present the first constant-factor approximation algorithm for maximum independent set of pseudo-disks in the plane, both in the weighted and unweighted cases. For the unweighted case, we suggest a local search algorithm that, in polynomial time, provides a 10 approximation to the optimal solution. For the weighted case, we suggest a novel rounding scheme based on an LP relaxation of the problem, that leads to a constant approximation.

Most previous algorithms for maximum independent set (in geometric settings) relied on packing arguments that are not applicable in this case. As such, the analysis of both algorithms requires some new ideas that we believe to be of independent interest.