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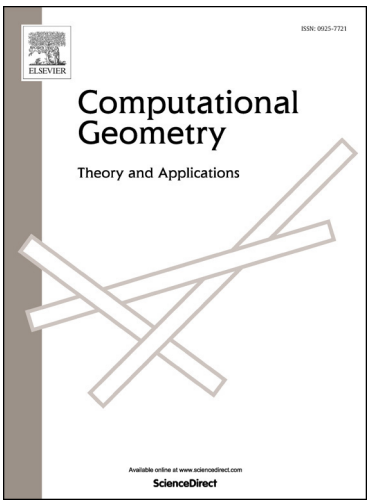

Elastic geometric shape matching for translations under the Manhattan norm

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Elastic Geometric Shape Matching for Translations under the Manhattan Norm

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Abstract

The term *elastic geometric shape matching* (EGSM) refers to geometric optimization problems that are a generalization of many classical and well-studied geometric shape matching problems. In a geometric shape matching problem, one seeks a *single* transformation that, if applied to a geometric object – the pattern – minimizes the distance of the transformed object to another geometric object – the model.

In an EGSM problem, the pattern is partitioned into parts which are transformed by a collection of transformations, called a *transformation ensemble*, in order to minimize the distance of the individually transformed parts to the model under the constraint that specific pairs of transformations of the ensemble have to be *similar*. These constraints are defined by an abstract graph on the parts of the model, called the *neighborhood graph*.

We present algorithms for an EGSM problem for point sets under translations where the neighborhood graph is a tree. We measure the similarity of the shapes by the L_1-Hausdorff distance (and the Hausdorff distance induced by other polygonal metrics).

Keywords: computational geometry, exact elastic shape matching, polygonal norms, approximation

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