

# Approximately Matching Polygonal Curves Using Group Theory

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Methods for matching geometric patterns have been studied extensively in the past years, including their applications ranging from machine vision and image databases to computational chemistry and drug design. In our poster we propose a method for matching polygonal curves in two dimensions. As a measure of similarity, we use the Frechet distance, which is based on certain optimal reparametrizations of the curves. We consider the case that the curves can be transformed by the group of rigid motions or the group generated by uniform scalings and translations.

Our poster gives an overview of the different steps leading to an efficient matching algorithm. As a first step, we provide results on discretizing the set of reparametrizations to be examined. This discretization result is the basis of our approximate matching algorithm that models the set of all possible reparametrizations as an acyclic digraph. Each edge is then assigned a certain transporter subset of the transformation group. Finding a path from the graph's source to the sink with the property that the intersection of the transporter subsets along the path's edges is non-empty finally solves the matching problem. In order to solve this intersection problem efficiently, we propose a method that simplifies the transporters to be intersected. Furthermore, we present visualizations of the transformation groups' transporter subsets and their intersections as well as relations to other pattern matching problems.