



# Efficient Detection of Symmetries of Polynomially Parametrized Curves

Juan G. Alcazar

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We present efficient algorithms for detecting central and mirror symmetry for the case of algebraic curves defined by means of polynomial parametrizations. The algorithms are based on the existence of a linear relationship between two proper polynomial parametrizations of the curve, which leads to a triangular polynomial system (with complex unknowns) that can be solved in a very fast way; in particular, curves parametrized by polynomials of serious degrees can be analyzed in a few seconds. In our analysis we provide a good number of theoretical results on symmetries of polynomial curves, algorithms for detecting rotation and mirror symmetry, and closed formulae to determine the symmetry center and the symmetry axis, when they exist. A complexity analysis of the algorithms is also given.

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