

Vanishing Component Analysis

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The vanishing ideal of a set of n points S , is the set of all polynomials that attain the value of zero on all the points in S . Such ideals can be compactly represented using a small set of polynomials known as generators of the ideal. Here we describe and analyze an efficient procedure that constructs a set of generators of a vanishing ideal. Our procedure is numerically stable, and can be used to find approximately vanishing polynomials. The resulting polynomials capture nonlinear structure in data, and can for example be used within supervised learning. Empirical comparison with kernel methods show that our method constructs more compact classifiers with comparable accuracy.