Integral Invariants

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Abstract

Integral Invariants have been proposed in the fields of shape recognition and classification as robust counterpart to differential invariants. To every point on the boundary of the object of interest a number is assigned, which is defined by integration of a given kernel function over the domain of the object. In this talk we focus on the circle integral invariant, where the kernel is the characteristic function of a ball. We discuss the question whether the assignment of a shape to the corresponding signature is injective, or in other words, whether a shape is uniquely determined by its signature. This injectivity is crucial in all classification applications. Closely related is the problem of reconstructing an object from its signature. We present numerical examples of reconstructions in two dimensions.