

An introduction to Christoffel-Darboux kernels for polynomial optimization

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The Christoffel-Darboux kernels captures support properties of measures

During this second lecture, we will illustrate how the Christoffel-Darboux kernel allows to capture properties of the underlying measure. I will start to describe advanced results on asymptotics for CD kernels in the univariate setting. Going to the multivariate setting, we will comment on orthogonal polynomials for specific constructions such as the Euclidean ball and the cube and mention some consequences for CD kernels. We will then consider the more general case of Lebesgue measure restricted to a compact set with non empty interior and highlight the exponential dichotomy between interior and exterior of the set. If time permits, we will mention the construction of CD kernels for singular measures.