Seminario de Análisis y Aplicaciones

Viernes, 23 de abril de 2021

11:30 h., ONLINE - URL: https://zoom.us/j/96993911826

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Necessary conditions for interpolation by multivariate polynomials

Resumen:

Let Ω be a smooth, bounded, convex domain in $\mathbb{R}^n$ and let $\{\Lambda_k\}_{k \geq 0}$ be a sequence of finite subsets of Ω. Denote by $\mathcal{P}_k$ the vector space of of multivariate real polynomials of degree at most k. In these spaces we will consider the Hilbert structure given by the L^2 norm associated to the Lebesgue measure.

In this talk we will discuss some necessary geometric conditions that assure that Λ_k is interpolating for $\mathcal{P}_k$. At each level k, the interpolating condition is simply the linear independence of the corresponding reproducing kernels. So, we are interested in asymptotic results in k. In particular, we will present density conditions that match precisely the necessary geometric conditions that sampling sets are known to satisfy. These density conditions are expressed in terms of the equilibrium potential of the convex set. If time permits, we will show that in the particular case of the unit ball, there is not an orthogonal basis of reproducing kernels in the space $\mathcal{P}_k$, when k is big enough.

This talk is based in a joint work with Jordi Marzo and Joaquim Ortega Cerdà.