Seminario de Análisis y Aplicaciones

Viernes, 29 de abril de 2016

10:30 h., Módulo 17 - Aula 520 (Depto. Matemáticas UAM)

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An approximation problem in invariant spaces

Abstract:

We consider the following general problem: Given a Hilbert space $\mathcal{H}$ and a class $\mathcal{C}$ of closed subspaces of $\mathcal{H}$, find for every finite set $\mathcal{F} \subseteq \mathcal{H}$ an element $S^* \in \mathcal{C}$ that best fits $\mathcal{F}$.

Let $\mathcal{H}$ be a Hilbert space and (Ω, μ) be a σ-finite measure space. Multiplicatively invariant (MI) spaces are closed subspaces of $L^2(\Omega, \mathcal{H})$ that are invariant under point-wise multiplication by functions in a fix subset of $L^\infty(\Omega)$. Given a finite set of data $\mathcal{F} \subseteq L^2(\Omega, \mathcal{H})$, in this talk we prove the existence and construct an MI space M that best fits $\mathcal{F}$, in the least squares sense. MI spaces are related to shift invariant (SI) spaces via a fiberization map, which allows us to solve an approximation problem for SI spaces in the context of locally compact abelian groups. On the other hand, we introduce the notion of decomposable MI spaces (MI spaces that can be decomposed into an orthogonal sum of MI subspaces) and solve the approximation problem for the class of these spaces. Since SI spaces having extra invariance are in one-to-one relation to decomposable MI spaces, we also solve our approximation problem for this class of SI spaces.

These results are based on a joint work with Carlos Cabrelli and Victoria Paternostro.

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