UNICAMP – IMECC
Departamento de Matemática

Seminário de Sistemas Dinâmicos e Estocásticos

Expositor: A. Gonzalez (Universidad de Mar del Plata)

Título: Haar crystallographic wavelets

Data: Sexta-feira, 2 de setembro de 2011, 15h30min

Local: Sala 321 do IMECC

Resumo. Recall that $\Psi = \{\psi^1, \ldots, \psi^L\} \subset L^2(\mathbb{R}^d)$ is a multiwavelet if

$$\{D_a^j T_k \psi^i : j \in \mathbb{Z},\, k \in \mathcal{R},\, i = 1, \ldots, L\}$$

is an orthonormal basis, Riesz basis, or frame for $L^2(\mathbb{R}^d)$, where a is an expansive $d \times d$ matrix, $\mathcal{R} = R\mathbb{Z}^d$ is a lattice, for g affine map $D_g f(x) = |\det(g)|^{-1/2} f(g^{-1}x)$, and $T_k f(x) = f(x-k)$ are the dilation and translation operators.

In this talk, we will introduce crystallographic multiwavelets as a finite set of functions Ψ, which generate an orthonormal basis, a Riesz basis or frame for $L^2(\mathbb{R}^d)$, under the action of a crystallographic group Γ (i.e. a group of isometries, for which there exists a bounded set $P \subset \mathbb{R}^d$ such that $\cup_{\gamma\in\Gamma}\gamma(P) = \mathbb{R}^d$ (measure disjoint)), and powers of an appropriate expanding affine map a, taking the place, referred to classical wavelets, of the translations on the lattice $\mathcal{R}$ and dilations, respectively. Associated crystallographic multiresolution analysis of multiplicity n ((Γ, a)-MRA) will be defined in a natural way. A complete characterization of (Γ, a)-MRA Haar type scaling vectors, related to (Γ, a)-multi–reptiles, is going to be given. We will also show examples in dimension 2 and 3.

Consulte a programação em [`www.ime.unicamp.br/ssde`].