1030-41-361 **Juan R Romero** (jrr@math.uh.edu), Department of Mathematics, University of Houston, Houston, TX 77204, **Manos Papadakis*** (mpapadak@math.uh.edu), Department of Mathematics, University of Houston, Houston, TX 77204-3008, **Saurabh Jain** (sjain@math.uh.edu), Department of Mathematics, University of Houston, Houston, TX, **Simon K Alexander** (simon@math.uh.edu), Department of Mathematics, University of Houston, Houston, TX 77204-3008, and **Shikha Baid** (shikha@math.uh.edu), Department of Mathematics, University of Houston, Houston, TX 77204-3008. *Rotational invariance and multiresolution analysis for 2D and 3D-image analysis.*

Our motivation to study the rotational invariance of multiresolution analysis comes from the wide use of fast wavelet algorithms in imaging applications such as texture segmentation and image analysis in general. A major problem in texture segmentation/identification is the lack of rotational invariance of the wavelets transforms. These transforms are desirable for texture segmentation/identification for they are computationally efficient and because textures are characterized by their granularity which appears in more than one scale. In an attempt to address the problem of rotational invariant 2D and 3D-texture segmentation we introduce the Isotropic Mutliresolution Analysis (IMRA) which we present in this talk. The resolution subspaces of this new structure are invariant under all rotations. In this talk we primarily focus on the mathematical theory of this new MRA. We show how to construct the scaling functions for IMRAs which are all radial and their associated wavelets which, in the frequency domain, are modulations of radial functions. To construct these wavelets we revisit the Extension Principles, Unitary and Oblique. (Received August 07, 2007)