1086-65-1891 **Gunay Dogan*** (gunay.dogan@nist.gov). *Shape Reconstruction from Direct and Indirect Measurements.*

Detection and reconstruction of shapes from sensor measurements is important to many areas of science and engineering. Examples are tracking cell shapes in automated microscopy images, delineation of tumor boundaries from computed tomography sinograms, or identification of grains in material micrographs. In this talk, I will introduce a numerical framework that enables us to compute and characterize shapes, such as sets of curves in 2d or surfaces in 3d, explicitly from given images or other indirect measurements. For this, I will formulate the shape reconstruction problem as an energy minimization task and then describe the numerical components to realize the minimization in an efficient and reliable manner. I will demonstrate the effectiveness of the method with several examples. (Received September 24, 2012)