1086-42-2742 **Adam Martinez*** (aemarti6@asu.edu). *Edge Detection from Non-Uniform Fourier Data via an Adapted Method of Convolutional Gridding.*

The detection of edges from discrete Fourier data is a field of interest in a variety of image processing contexts from radio astronomy to medical imaging. For example, segmentation and target identification algorithms require knowledge of internal boundaries. The Fast Fourier Transform (FFT) is the industry standard for all image processing applications from Fourier data, including reconstruction and segmentation. However, it relies on the spectral data being sampled at integer points. In applications such as magnetic resonance imaging (MRI), it has recently become more common for this frequency data to be non-uniformly sampled because various new sampling schemes allow for better minimization of artifacts using the same number of sampling locations. The method of convolutional gridding (also referred to as the non-uniform FFT) is commonly practiced as a means to "regrid" non-uniform data to integer points for the purpose of image reconstruction. In this talk we deconstruct the convolutional gridding method and describe how its parameters can be analytically determined for better accuracy and efficiency in image processing applications such as reconstruction and segmentation. (Received September 25, 2012)