**COLLOQUIUM**

Department of Computer Science and Engineering

University of South Carolina

### **Super-Resolution Image Reconstruction**

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Time: **1400-1500 (2-3pm)**

Place: **Swearingen 1A03 (Faculty Lounge)**

# Abstract

Image reconstruction is a mathematical process to retrieve information that has been lost or obscured in the imaging process. The cause of degradation in the imaging process is mainly due to optical distortion, motion blur due to limited shutter speed, environmental noise and aliasing effects. In contrast to image enhancement, where the appearance of an image is improved to suit human subjective preferences, image reconstruction is an objective approach to recover the image based on mathematical and statistical models of image degradation. However, enhancement of the resolution of the reconstructed image is a key requirement to improve both pictorial information for human interpretation and representation for automatic machine perception. High resolution refers to high pixel density. Images with high pixel density offer important and critical information in various practical applications. Super Resolution (SR) reconstruction is one of the software level solutions for the enhancement of the spatial resolution of the reconstructed image. The term “super” in super resolution signifies that the technique can overcome the inherent resolution limitation of LR imaging systems. It works by the fusion of non-redundant information contained in single or multiple low resolution images of the same source image with sub-pixel shifts. SR reconstruction overcomes the limitations associated with hardware implementations along with of theory of optics to increase the resolution of an image. This method has a wide range of applications such as: surveillance video, remote sensing, medical imaging and video standard conversion. This talk is to provide a review of the current state of research on super-resolution reconstruction with some potential future directions.

**Dr. Dipti Patra** is an Associate Professor in the Electrical Engineering Department at the National Institute of Technology in Rourkela, India. She obtained the Ph.D. degree in Electrical Engineering from the same institution in 2006. Her major research focus areas are Digital Signal (especially Image and Video) Processing, Computer Vision, and Stochastic Processes. She is a Senior Member of IEEE, Fellow of Institution of Electronics and Telecom Engineers, India, Fellow of The Institution of Engineers, India. She has published 55 research papers in national or international refereed journals and conference proceedings. She has been the reviewer of many international journals such as: IET Image Processing (IET), Systems and Information Sciences (Elsevier), Mathematical Problems in Engineering, Arabian Journal in Science & Engineering (Springer), Computer Journal (Oxford University Press), and Hindwai Journals. She has worked as a Program Committee Member of many IEEE International Conferences, e.g. Pattern Recognition & Machine Intelligence 2013. Currently (September 13-16), she is a visitor at the University of South Carolina doing collaborative research work with Prof. Yan Tong with support from an international faculty exchange program.