

Title: Image Restoration, Colorization and Segmentation

Abstract: This talk will start with an introduction to image processing, from a well-known Total Variation minimizing denoising. The talk will cover few models in image reconstruction such as inpainting and colorization. The term ``colorization'' was introduced by Wilson Markle who first processed the gray scale moon image from the Apollo mission. Couple of variational colorization models will be presented which demonstrates different effects. Another direction of using Reproducing Kernel Hilbert Space approach will be presented for an effective colorization application. A link to image segmentation will be made through medical image application. Image segmentation separates the image into different regions to simplify the image and identify the objects easily. Mumford-Shah and Chan-Vese model are one of the most well-known variational models in the field. Starting from these models, this talk will include a model segmenting piecewise constant images with irregular object boundaries, and consider some features of multiphase segmentation.