Meeting: 1002, Pittsburgh, Pennsylvania, SS 15A, Special Session on PDE-Based Methods in Imaging and Vision

1002-65-115 **Tony Chan** and **Sung Ha Kang*** (skang@ms.uky.edu), 715 Patterson Office Tower, University of Kentucky, Lexington, KY 40506. *Error Analysis for Image Inpainting.* Preliminary report.

Image inpainting is to restore a damaged image with missing information. In recent years, there have been many developments on computational approaches to image inpainting problems. While there are many effective algorithms available, it was lacking a theoretical understanding of under what conditions do these algorithms work well. This talk is a step in this direction, investigating the error bound for the inpainting method, by considering different image space such as smooth continuous function, piece-wise constant function and piece-wise continuous function space.

For the smooth function with harmonic extension, we show the error depends on the maximum of local width of the inpainting domain using the Green's function. As for piece-wise cases with TV inpainting, the error depends on the direction and the curvature of the level lines meeting with the boundary of the inpainting domain as well as the smoothness of the image. (Received September 09, 2004)