1082-62-289 **Stacey Levine*** (sel@mathcs.duq.edu), Duquesne University, Pittsburgh, PA, **Katie Heaps**, Duquesne University, **Joshua Koslosky**, University of Minnesota, and **Glenn Sidle**, Duquesne University. *Image Fusion using Gaussian Mixture Models.* Preliminary report.

A number of recent works have demonstrated that using patches, in lieu of pixels, as image features can more effectively perform various techniques such as denoising, deblurring, inpainting and super-resolution. This if often carried out by sparsely representing the images patches in appropriately defined, possibly redundant, dictionaries. Yu, Sapiro, and Mallat showed that a related but more stable solution can be found by estimating the patches using Gaussian Mixture Models (GMMs), particularly when solving ill-posed inverse problems such as deblurring and super-resolution. In this talk we discuss how this GMM approach can be can be used for fusing images of the same field of view, suffering from any or all of the above-mentioned degradations. The fusion model retains many of the nice properties of the single image GMM model such as its equivalence to finding an optimal sparse representation in a PCA dictionary, and can be simply modified to handle spatially varying features, including geometric features (e.g. edges, smooth regions, and textures) as well as spatially varying noise levels. (Received July 10, 2012)