1135-VN-1585 **Lasith Adhikari** (ladhikari@ucmerced.edu), **Reheman Baikejiang** (rbaikejiang@ucdavis.edu), **Omar DeGuchy*** (odeguchy@ucmerced.edu) and **Roummel F. Marcia** (rmarcia@ucmerced.edu). *Non-Convex Shannon Entropy for Photon-Limited Imaging.*

Photon-limited imaging is used in a variety of applications including night vision, astronomy and medical imaging. The key characteristic of the low-photon imaging process is that the measurements at the detector are corrupted by noise and are typically modeled using the Poisson distribution. Under this Poisson model assumption, the goal is to reconstruct high-dimensional sparse signals from noisy low-dimensional, low-photon count observations. This reconstruction involves a challenging non-linear optimization problem requiring the minimization of the negative Poisson log-likelihood function. In our work, we assume the signal has a sparsity structure we can exploit in the reconstruction. Typically this is done using an $\ell_1$-norm penalty. This research builds upon previous work on minimizing the Poisson log-likelihood and incorporates more recent results on the generalized non-convex Shannon entropy function to promote sparsity in solutions. We explore the effectiveness of the proposed approach using numerical experiments involving 1-D signal recovery and medical imaging. (Received September 25, 2017)