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Triet Le, Rick Chartrand* (rickc@lanl.gov) and **Thomas J. Asaki.** *A variational approach to reconstructing images corrupted by Poisson noise.*

Image denoising is an important aspect of processing experimental data. Many existing denoising algorithms implicitly assume that the noise is additive and Gaussian. Many experiments, however, collect data by counting particles, in which case the noise is Poisson. We propose a new variational model to denoise an image corrupted by Poisson noise. Like the popular Rudin-Osher-Fatemi model, our model uses total-variation regularization. Unlike the ROF model, we use a data-fidelity term that is suitable for Poisson noise. The result is a signal-dependent regularization that matches the signal-dependent nature of Poisson noise. (Received August 15, 2005)