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Walid K Sharabati* (wsharaba@purdue.edu) and **Mohamed El-Gebeily** (mgebeily@kfupm.edu.sa). *A Stochastic Approach of the Total Variation-Based Model for Image Reconstruction.*

The objective of image deblurring is to reduce the noise generated when the lens is out of focus, incoming light is bent, or object moves while shutter is open. In this work, we present a total variation model based on Tikhonov regularization with random coefficients to reconstruct the original image, the optimizer produces a nonlinear system of elliptic type integro-differential equations. To this end, we introduce a stochastic smoothing operator and develop a stochastic version of the cell-centered finite difference (CCFD) scheme defined on suitable finite dimensional deterministic and probability spaces. We incorporate spectral expansion techniques such as the KL expansion to eliminate the dependency on the random effect. The work also includes a discussion of the existence and uniqueness as well as convergence and stability of the approximated solution in the discretized subspaces. (Received September 16, 2013)