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We present a new 'class' of models for image restoration and decomposition based on the Total-Variation-Minimization framework of Rudin-Osher-Fatemi. In our model, the data image f is decomposed into the sum of u and $v = f - u$, where u is the piecewise-smooth (cartoon) component and v the oscillatory (noisy and textured) part of f. Motivated by Y. Meyer's suggestions to model the v component with norms weaker than the L^2 norm, by Osher-Solé-Vese (BV, H^{-1}) model, and by Mumford-Gidas's remark that Gaussian white noise is supported in $\cap_{\epsilon>0} H_{loc}^{-1-\epsilon}$, we impose in our model that u be in the space of bounded variation $BV(\Omega)$ and v be in the 'class' of negative Hilbert-Sobolev spaces $H^{-s}(\mathbb{R}^2)$, for $s > 0$. Under these constraints, our derived energy functional is strictly convex, hence existence and uniqueness of solution is guaranteed. When $s = 0$, our model reduces to the (BV, L^2) decomposition of Rudin, Osher, and Fatemi. We present a numerical algorithm for computing the H^{-s} norm for images, as well as for computing the minimizer of the energy functional in our model. We also give the definition for a semi-norm $|\cdot|_*$ with which we are able to give characterizations of minimizers. (Received August 15, 2005)