1056-49-1648   **Tom Goldstein***, UCLA Department of Mathematics, Box 951555, Los Angeles, CA 90095, and **Xavier Bresson** and **Stanley Osher**. *Global Minimization of Markov Random Fields with Applications to Optical Flow.*

Many problems in image processing can be posed as non-convex minimization problems. For certain classes of non-convex problems involving scalar-valued functions, it is possible to recast the problem in a convex form using a "functional lifting" technique. In this paper, we present a variational functional lifting technique that can be viewed as a generalization of previous works by Pock et. al and Ishikawa. We then generalize this technique to the case of minimization over vector-valued problems, and discuss a condition which allows us to determine when the solution to the convex problem corresponds to a global minimizer. This generalization allows functional lifting to be applied to a wider range of problems then previously considered. Finally, we present a numerical method for solving the convexified problems, and apply the technique to find global minimizers for optical flow image registration. (Received September 22, 2009)