1086-65-2974   **Egil Bae*** (`ebae@math.ucla.edu`), Department of Mathematics, UCLA, Los Angeles, CA 90025.
Convex Variational Models and Efficient Optimization Algorithms for Image Segmentation.

Many of the most successful mathematical models for image segmentation and other partition problems are formulated as variational or discrete optimization problems. These problems are typically non-convex or NP-hard, which poses fundamental difficulties from a computational point of view. This is especially the case if the number of regions is larger than two, or if unknown region description parameters are part of the optimization problem. In this talk, I will present convex formulations and relaxations of such problems, which are later used to develop very efficient optimization algorithms. Under certain conditions, the algorithms are guaranteed to converge to a global minimum of the original problems. The conditions can in some cases can be checked in advance based on the input data and otherwise be checked after computation. Even if they are not met exactly, it is demonstrated that close approximations to global minima can be obtained. (Received September 26, 2012)