

# Multiscale Random Fields with Application to Contour Grouping

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We introduce a new interpretation of multiscale random fields (MSRFs) that admits efficient optimization in the framework of regular (single level) random fields (RFs). It is based on a new operator, called append, that combines sets of random variables (RVs) to single RVs. We assume that a MSRF can be decomposed into disjoint trees that link RVs at different pyramid levels. The append operator is then applied to map RVs in each tree structure to a single RV. We demonstrate the usefulness of the proposed approach on a challenging task involving grouping contours of target shapes in images. It provides a natural representation of multiscale contour models, which is needed in order to cope with unstable contour decompositions. The append operator allows us to find optimal image segment labels using the classical framework of relaxation labeling. Alternative methods like Markov Chain Monte Carlo (MCMC) could also be used.

**Friday, December 5th, 2008**

**2:40PM**

**Room: MG 120**

**Refreshments in MG 226 at 2:20pm**