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Jung-Ha An* (jan@csustan.edu), One University Circle, Turlock, CA 95382, and **Yunmei Chen**. *A MODIFIED PIECEWISE CONSTANT MUMFORD-SHAH MODEL BASED SIMULTANEOUS IMAGE SEGMENTATION AND REGISTRATION*. Preliminary report.

A new variational region based model for a simultaneous image segmentation and registration is proposed. The purpose of the model is to segment and register novel images simultaneously using a modified piecewise constant Mumford-Shah technique and region intensity values. The segmentation is obtained by minimizing a modified piecewise constant Mumford-Shah model. A registration is assisted by the segmentation information and region intensity values. The numerical experiments of the proposed model are tested against simulated normal noisy human-brain magnetic resonance (MR) images. The preliminary experimental results show the effectiveness of the model in detecting the boundaries of the given objects and registering novel images simultaneously. (Received September 22, 2009)