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Stereoscopic Segmentation: A Unified Framework for Segmentation and
Surface Reconstruction

We propose a variational framework for estimating the 3D shape and radiance of illuminated Lambertian surfaces from a set of 2D images. We utilize an energy functional (similar to Mumford-Shah) designed to capture the best set of image segmentations (via projection) consistent with smoothness constraints on the surface and its radiance. The resulting gradient flows give rise to evolving functions (radiance) on evolving manifolds (shape).