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Non-parametric Mixture Model for Unsupervised Image Segmentation. Preliminary report.

Mixture models have many uses in data science, including clustering and image segmentation. We present an unsupervised image segmentation method applied to natural images. In our research, we model an image as a mixture of color distributions, each coming from a distinct segment in the image. The goal is to estimate the color distributions from all the regions in the image and use them to segment the image. To solve for the distributions, we developed a scheme that solves a subset of the equations in our model, uses least squares to find the missing entries, and then performs coordinate descent to refine the approximation. The parameters in our model are estimated by measuring how well they recover the observed data. We present results on natural images and materials. (Received September 13, 2019)