A Mixture Model of Circular-Linear Distributions for Color Image Segmentation

Abstract

This article deals with mixture model based color image segmentation in the LCH color space. In this space, one of the components (representing hue in particular) is circular in nature. Hence LCH image pixels are samples on a cylinder. A statistical model for such data needs to employ circular-linear joint distributions. Here such a model is designed using the "Independent von-Mises Gaussian" distribution. Further its mixture is used to approximate the distribution of the LCH data. The mixture parameters are estimated using standard EM algorithm. Comprehensive experiments are conducted on Berkeley segmentation data set to measure the performance of the algorithm in terms of a variety of quantitative indices for image segmentation. A comparison is further made with some existing mixture models. Our study reveals that the proposed mixture model performs satisfactorily in this regard.

References

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