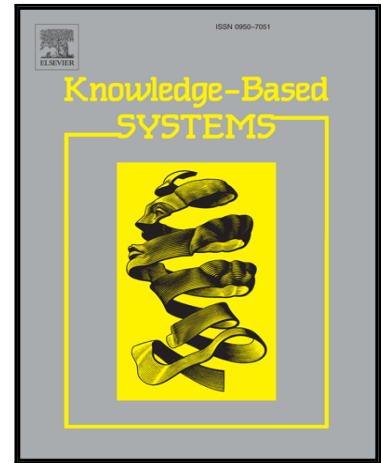


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Unsupervised Geographically Discriminative Feature Learning for Landmark Tagging

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Abstract

Recently, a large number of geo-tagged landmark images have been uploaded through various social media services. Usually, these geo-tagged images are annotated by users with GPS and tags related to the landmarks where they are taken. Landmark tagging aims to automatically annotate an image with the tags to describe the landmark where the image is taken. It has been observed that the images and tags show strong correlation with the geographical locations. The widely used assumption by many existing tagging methods is that images are independently and identically distributed is not effective to capture the geographical correlation. In this paper, we study the novel problem of utilizing the geographical correlation among images and landmarks for better tagging landmark images. In particular, we propose an unsupervised feature learning approach to learn the geographically discriminative features across geographical locations, by integrating latent space learning and geographically structural analysis (LSGSA) into a joint model. A latent space learning model is proposed to effectively fuse the heterogeneous features of visual content and tags. Meanwhile, the geographical structure analysis and group sparsity are applied to learn the geographically discriminative features. Then, a geo-guided sparse reconstruction method is proposed to tag images by utilizing the discriminative information of features, in which the landmark-specific tags are boosted by a weighting method. Experiments on the real-world datasets demonstrate the superiority of our approach.

Keywords: Image tagging, Feature learning, Landmark image, Landmark features

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