

TELKOM UNIVERSITY

Abstract

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Superpixels Based Region Label Annotation On Natural Scene Images

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Region Label Annotation is an approach to predict the relation between semantic concepts and objects within an image automatically. In this research, combination of contextual cueing based topological position and neighborhood relationship probability is presented for 7 classes (sky, vegetation, snow, water, ground, street, and sand) of objects. The proposed method consists of two operations namely Superpixel Level Training and Image Level Annotation Testing. Superpixel Level Training began with building a new ground truth from each of training images. These ground truth originated from superimposing polygon annotation to superpixel. The aims of training process were to generate a classifier model which was produced from a total of 61 color and texture features from each superpixel on training images. The later operation had two steps, superpixel level annotation and label refining contextual cueing. Superpixel level annotation was a method to classify the label from each of superpixel on testing image. Meanwhile, Contextual cueing was used to refine the imprecise labeling from the earlier method. Two performance evaluations of the proposed method were conducted using LabelMe dataset. The first evaluation was performed to evaluate the system on the superpixel level, promisingly the method could handle small or insufficient regions classes namely, sand and snow about 80.08% and 74.21% respectively. The second experiment was performed to evaluate the system on image level, resulting prediction accuracy for two, three and four associated labels for test image by 85.1%, 75.8%, and 74.9% respectively.

Keywords: region label annotation, contextual cueing, automatic image annotation, superpixel