Abstract

Image segmentation is critical for many computer vision and information retrieval systems, and has received significant attention from industry and academia over last three decades. Despite notable advances in the area, there is no standard technique for selecting a segmentation algorithm to use in a particular application, nor even is there an agreed upon means of comparing the performance of one method with another. This paper, explores Rough-Fuzzy K-means (RFKM) algorithm, a new intelligent technique used to discover data dependencies, data reduction, approximate set classification, and rule induction from image databases. Rough sets offer an effective approach of managing uncertainties and also used for image segmentation, feature identification, dimensionality reduction, and pattern classification. The proposed algorithm is based on a modified K-means clustering using rough set theory (RFKM) for image segmentation, which is further divided into two parts. Primarily the cluster centers are determined and then in the next phase they are reduced using Rough set theory (RST). K-means clustering algorithm is then applied on the reduced and optimized set of cluster centers with the purpose of segmentation of the images. The existing clustering algorithms require initialization of cluster centers whereas the proposed scheme does not require any such prior information to partition the exact regions. Experimental results show that the proposed method perform well and improve the segmentation results in the vague areas of the image.
Image Segmentation using Rough Set based Fuzzy K-means Algorithm

References

- Borji A. and Hamidi M. Evolving a fuzzy rule base for image segmentation, Proceedings of world academy of science, engineering and technology, vol. 22, July 2007, pp. 4-9

Index Terms

Computer Science  Pattern Recognition

Keywords

Uncertain Images  RGB images  Rough Set  K-means algorithm