Abstract

In human body, the cells are arranged in a particular pattern. Neoplastic diseases such as cancer may cause a change in these arrangements. Different methods can be used to quantify these patterns. This study mainly focuses on the structural representation of colon tissue and the graph features used to diagnose and grade the cancer. The different graph techniques used in structural method are color graphs, colorless graphs and probabilistic graphs.

The inputs for the system are histopathological images. These images are pre-processed and then clustered according to luminal, stromal and nucleus components using k-means clustering algorithm. Then the centroids of each component are found out using region-props algorithm for each cluster in the whole image. Then these centroids are eroded and represented as disk structures and these disks are considered as set of nodes. Finally Delaunay diagram is created by connecting the nodes using different colored edges. From the diagram, set of features such as edge length, average edge length and diameter are extracted. These features are given to the ANN (Artificial Neural Network), which will accurately classify the images according to the
grade of cancer to which they belong.

References

1. Dogan Altunbay, Celal Cigar, Cenk Sokmensuer, and Cigdem Gunduz-Demir, "Color
GRapghs for automated cancer diagnosis and Grading", IEEE transaction on biomedical
engineering, vol.57, no. 3 March 2010
3. M. Wiltgen, A. Gerger, and J. Smolle, “Tissue counter analysis of benign common nevi and
aided prognosis of neuroblastomas on whole slide images: Claffication of Stromal development”
Pattern Recognit, vol 42 no. 6, pp 1093-1103, 2009
5. B. Weyn, G van de wouwer, S. kumar-singh, A. van Daele, P. Scheunders, E. van Marck
and W. Jacob, "Computer –Assisted differential diagnosis of malignant mesothelio ma based on
syntactic structure analysis” Cytometry, vol 35, pp. 23-29, 1999
texture analysis for the un-supervised segmentation of biopsy images for cancer detection,”

Index Terms

Computer Science

Applied Sciences

Keywords

Delaunay triangle, Node creation, ANN classification