Abstract

The idea to use texture analysis in medical imaging has been considered since the early 1970s. However, the exciting evolution of both texture analysis algorithms and computer technology revived researchers' interest in applications for medical imaging in recent years. Technical innovations in medical cross-sectional imaging have opened up new vistas for the exploration of the human body, enabling both high spatial and temporal resolution. On Difficulties Caused by Missing Reference Image Datasets One of the main problems in the development of systems for the analysis of medical images or segmentation algorithms is the set of images that is used for both the development and the testing of the system. This paper proposes a diagnostic scheme follows a familiar two-step approach. Initially, textural information is extracted from the image. Subsequently, the extracted information is fed into a decisional algorithm that is designed to perform the diagnostic task. The talk covers new methods for
pattern recognition and computer-aided diagnosis in the field of MRI, such as functional MRI for human brain mapping, therapy control by automatic lesion detection in multiple sclerosis, and new approaches to breast cancer diagnosis in MRI mammography. In the light of such innovative techniques for pattern recognition in biomedicine, the increasing demand for publicly accessible validation platforms is emphasized. With image texture analysis in the role of the visual perceptual function, the process of feature extraction and image coding is achieved. The extracted features can now be merged into a diagnosis by using a decision-making algorithm, with choices that range from the rule-based models to the traditional statistical analysis to the more popular (and often more successful) artificial intelligence techniques, such as neural networks and genetic algorithms. By using image texture analysis as the preprocessing step in CAD schemes, the input generation process is automated and, therefore, is reproducible and robust. Some techniques represent texture on the basis of the spectral properties of an image. Others are model-based techniques that analyze texture by identifying an appropriate model that reflects the prior beliefs and knowledge about the type of images to be analyzed. There are textural features that describe local image statistics and others that describe global statistics.

Reference

- Petrick N, Chan HP, Wei D, Sahiner B, Helvie MA, Adler DD. Automated detection of breast masses on mammograms using adaptive contrast enhancement and texture

**Index Terms**

Computer Science

Pattern Recognition

**Key words**

Textual image

CAD

Pattern recognition

Pattern matching