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Editorial

The integration of image processing and machine learning for the diagnosis of stroke in CT

Nowadays, artificial intelligence based on machine learning is super popular. The success of the mechanism can be referred to statistical analysis. However, even no candidate feature can achieve significant, the tremendous computation using random combination of various parameters could find a relevant model for classification. The result with high accuracy may be promising but lack of enough reliability. For decision making upon medical images, some clinical evidences are already proven to have connections to the underlying biological meaning. In such way, extracting meaningful image features and combining them in an artificial intelligence classifier after image processing can provide more reliable accuracy in clinical use. The article introduced in this editorial choice focused on the roles of automatic methods based on image processing and machine learning for medical use.

In the study of "New approach to detect and classify stroke in skull CT images via analysis of brain tissue densities [1]", stroke which cause death and serious physical limitations around the world is the target disease. Diagnosis of stroke is emergent. This study introduced computed tomography (CT) as the most appropriate technique to confirm the occurrence and to investigate its extent and severity. On clinical examination, although three-dimensional imaging can provide the whole structure presentation, the measurement and evaluation is difficult to human beings. A computer- aided diagnosis system is then proposed to calculate radiological density patterns of the brain, called Analysis of Brain Tissue Density (ABTD). Image features such as gray-level co-occurrence matrix, local binary patterns, central moments, statistical moments, Hu's moment and Zernike's moments were used. As a results, ABTD achieved the accuracy of 99.30%. The developed ABTD is a useful algorithm to potentially assist doctors in stroke diagnosis.

The other two studies selected by the Editor for this issue are about heart rate variability metrics for stress level assessment by Pereira et al. [2] from Portugal and a real-time stress classification system based on arousal analysis of the nervous system by Martinez et al. [3] from Spain. We hope you will enjoy reading these and other interesting articles from this monthly issue of CMPB.

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