Semi-automated Classification of CT Scans in Traumatic Brain Injury Patients

Abstract

A ‘silent epidemic’ affecting millions worldwide every year is the Traumatic Brain Injury. Management of these patients essentially involves neuroimaging and noncontrast Computed Tomography (CT) scans are the first choice amongst doctors. However, interobserver variability, considered ‘Achilles heel’ amongst radiologists, can lead to missed diagnoses and grave consequences. This paper presents a hybrid approach for semi-automated classification of CT features according to Marshall CT Scheme. The proposed method uses template matching, artificial neural networks and active contours for segmentation of significant anatomical landmarks and estimation of haematoma volume on brain CT scans. The proposed method is efficient and robust in segmenting cross-sectional, noncontrast CT scans and has been evaluated on images from subjects with different ages and both genders. The hybrid method has an average ICC 0.97 and Jaccard Index 0.86 compared with the manual demarcations by radiology experts and performs better than the state of the art. Hence, the approach can be used to provide second opinions very close to the experts' intuition.

References

- Radhakrishna Achanta, Appu Shaji, Kevin Smith, Aurelien Lucchi, Pascal Fua, and
Semi-automated Classification of CT Scans in Traumatic Brain Injury Patients


Index Terms

Computer Science  
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**Keywords**

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