Artificial intelligence with big data analytics-based brain intracranial hemorrhage e-diagnosis using CT images

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Abstract

Due to the fast development of medical imaging technologies, medical image analysis has entered the period of big data for proper disease diagnosis. At the same time, intracerebral hemorrhage (ICH) becomes a serious disease which affects the injury of blood vessels in the brain regions. This paper presents an artificial intelligence and big data analytics-based ICH e-diagnosis (AIBDA-ICH) model using CT images. The presented model utilizes IoMT devices for data acquisition process. The presented AIBDA-ICH model involves graph cut-based segmentation model for identifying the affected regions in the CT images. To manage big data, Hadoop Ecosystem and its elements are mainly used. In addition, capsule network (CapsNet) model is applied as a feature extractor to derive a useful set of feature vectors. Finally, the presented AIBDA-ICH model makes use of the fuzzy deep neural network (FDNN) model to carry out classification process. For validating the superior performance of the AIBDA-ICH method, an extensive set of simulations were performed and the outcomes are examined under diverse aspects. The experimental values pointed out the improved e-diagnostic performance of the AIBDA-ICH model over the other compared methods with the precision and accuracy of 94.96% and 98.59%, respectively.

Keywords

e-Diagnosis, Internet of medical things, Artificial Intelligence, Deep learning, Intracerebral hemorrhage

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