

عنوان مقاله:

An Effective Approach for Automated Lung Node Detection using CT Scans

محل انتشار:

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نویسندگان:

MSc, Department of Computer Engineering, Faculty of Engineering, Mamasani Higher Education Center, - - -
Mamasani, Iran

MSc, Department of Computer Engineering, Faculty of Engineering, Salman Farsi University of Kazerun, - - -
Kazerun, Iran

BSc, Department of Computer Engineering, Salman Farsi University of Kazerun, Kazerun, Iran - - -

خلاصه مقاله:

Background: Pulmonary or benign nodules are classified as nodules with a diameter of ۳ cm or less and defined as non-cancerous nodules. The early diagnosis of malignant lung nodules is important for a more reliable prognosis of lung cancer and less invasive chemotherapy and radiotherapy procedures. Objective: This study aimed to introduce an improved hybrid approach for efficient nodule mask generation and false-positive reduction. Material and Methods: In this experimental study, nodule segmentation preprocessing was conducted to prepare the input computed tomography (CT) scans for the U-Net convolutional neural network (CNN) model, and includes the normalization of CT scans and transfer of pixel values corresponding to the radiodensity of Hounsfield Units (HU). A U-Net CNN was developed based on lung CT scans for nodule identification. Results: The U-net model converged to a dice coefficient of ۰.۶۷۸ with a sensitivity of ۷۵%. Many false positives were considered in every real positive, at ۱۱.۱, reduced in the proposed CNN to ۲.۳۲ FPs (False Positive) per TP (True Positive). Conclusion: Based on the disadvantages of the largest nodule, the similarity of extracted features of the current study with those of others was imperative. The improved hybrid approach introduced was useful for other image classification tasks as expected.

کلمات کلیدی:

Lung nodule detection, Deep Learning, Deep Convolutional Neural Networks, Diagnostic Imaging, Lung Neoplasms, Early Diagnosis

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