Abstract

Early stage Detection and Classification of pulmonary nodule diagnostics from CT images is a complicated task. The risk assessment for malignancy is usually used to assist the physician in assessing the cancer stage and creating a follow-up prediction strategy. Due to the difference in size, structure, and location of the nodules, the classification of nodules in the computer-assisted diagnostic system has been a great challenge. While deep learning is currently the most effective solution in terms of image detection and classification, there are many training information required, typically not readily accessible in most routine frameworks of medical imaging. Though, it is complicated for radiologists to recognize the inexplicability of deep neural networks. In this paper, a Consignable Multi-Model (CMM) is proposed for the detection and classification of a lung nodule, which first detect the lung nodule from CT images by different detection algorithms and then classify the lung nodules using Multi-Output DenseNet (MOD) technique. In order to enhance the interpretability of the proposed CMM, two inputs with multiple early outputs have been introduced in dense blocks. MOD accepts the
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detect patches into its two inputs which were identified from the detection phase and then classified it between benign and malignant using early outputs to gain more knowledge of a tumor. In addition, the experimental results on the LIDC-IDRI dataset demonstrate a 92.10% accuracy of CMM for the lung nodule classification, respectively. CMM made substantial progress in the diagnosis of nodules in contrast to the existing methods.

References


Index Terms

Computer Science

Artificial Intelligence

Keywords

Machine Learning, Lung Nodule Detection & Classification, Consignable Multi-Model, LIDC-IDRI