عنوان مقاله:

A Two-Stage Method for Diagnosing COVID-۱۹, Leveraging CNN, and Transfer Learning on CT Scan Images

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خلاصه مقاله:

Lung infection represents one of the most perilous indicators of Covid-۱۹. The most efficient diagnostic approach entails the analysis of CT scan images. Utilizing deep learning algorithms and machine vision, computer scientists have devised a method for automated detection of this disease. This study proposes a two-stage approach to identifying lung infection. In the initial stage, image features are extracted through a transfer learning framework employing ResNet۵۰, with the last two layers being fixed. Subsequently, a CNN neural network is constructed for image detection and categorization in the second stage. By employing superior image feature selection and minimizing non-informative features, this proposed method achieves impressive accuracy metrics: ۹۸.۹۹% accuracy, ۹۸.۹۱% sensitivity, and ۹۹.۱۰% specificity. Furthermore, a comparative analysis is conducted between this method and six other architectures (Inception, InceptionResNetV۲, ResNet۱۰۱, ResNet۱۵۲, VGG۱۶, VGG۱۹), with and without transfer learning. The findings demonstrate that the proposed method attains ۹۸% accuracy on test data, without succumbing to overfitting.

کلمات کلیدی:
Natural Network, convolution, Deep Learning, covid ۱۹, CT scan radiographs

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