

Comprehensive Evaluation of COVID-19 Through Chest Images

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Abstract : The coronavirus disease 2019 (COVID-19) was discovered and rapidly spread to various countries around the world since the end of 2019. Computed tomography (CT) images have been used as an important alternative to the time-consuming RT. PCR test. However, manual segmentation of CT images alone is a major challenge as the number of suspected cases increases. Thus, accurate and automatic segmentation of COVID-19 infections is urgently needed. Because the imaging features of the COVID-19 infection are different and similar to the background, existing medical image segmentation methods cannot achieve satisfactory performance. In this work, we try to build a deep convolutional neural network adapted for the segmentation of chest CT images with COVID-19 infections. First, we maintain a large and novel chest CT image database containing 165,667 annotated chest CT images from 861 patients with confirmed COVID-19. Inspired by the observation that the boundary of an infected lung can be improved by global intensity adjustment, we introduce a feature variable block into the proposed deep CNN, which adjusts the global features of features to segment the COVID-19 infection. The proposed PV array can effectively and adaptively improve the performance of functions in different cases. We combine features of different scales by proposing a progressive atrocious space pyramid fusion scheme to deal with advanced infection regions with various aspects and shapes. We conducted experiments on data collected in China and Germany and showed that the proposed deep CNN can effectively produce impressive performance.

Keywords : chest, COVID-19, chest Image, coronavirus, CT image, chest CT

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