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Artificial intelligence CNN-WCA model and Weiner filtered FRFCM image segmentation technique for extraction and classification COVID-19 Virus

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Abstract

The COVID-19 disease started during the period December 2019 in China, and spreads rapidly throughout the world caused death of more than million peoples as per the WHO. Diagnosis of COVID-19 diseases is a very important part in its treatment. A prime reason behind an increase in the number of COVID-19 patients worldwide is the ignorance of people towards treatment in its early stages. This research work proposes a novel Weiner filter based fast and robust Fuzzy C Means (FRFCM) segmentation technique for detection of tissues from COVID-19 image and Deep CNN-WCA model for classification of diseases. As the COVID-19 images are X-Ray images, from which it is difficult to extract the COVID-19 tissues, to avoid such situation we are motivated to apply the proposed FRFCM technique. The segmented images are applied to the, proposed AI based Deep CNN-WCA (Convolutional neural network with water cycle algorithm) for classification of the type of diseased tissues for visual localization by the radiologists. Further, a future central IoT based monitoring system, we are proposing through the proposed artificial intelligence Deep CNN-WCA model to serve the patients affected by COVID-19 which will help doctors to identify and classify the covid-19 diseases with automated system.

Keywords: Fuzzy C Means (FCM); Convolutional Neural Network (CNN); Artificial Intelligence (AI); Water Cycle Algorithm (WCA)

1. Introduction

Due to the COVID-19, the world economy, education system are drastically affected. Corona viruses are categorized as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) and SARS-CoV. Research evidence suggests that SARS-CoV-2(COVID 19) is the severe stage of infections in chest and lungs. The COVID-2019 epidemic is a member of the family of Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). It is difficult for the doctors to identify the presence of virus from the X-Ray image due to its slow growth. The COVID-19 disease started during the period December 2019 in China, and spreads rapidly throughout the world caused death of more than million peoples as per the WHO [1]. According to the report all countries followed lock down to save their peoples from the virus affect. COVID-19 affects drastically in the countries such as Italy, Spain and Iran, US, Germany [2-5] directly. Ethiopia also affected by CORONA-19, but

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