Abstract

Coronavirus Diseases 19 (COVID-19) first appeared in the city of Wuhan, China, at the end of 2019 and spread to several countries in a short time. With the rapid spread, an early diagnosis of COVID-19 is needed to prevent further spread and reduce the number of deaths. Reverse Transcription Polymerase Chain Reaction (RT-PCR) is one of the methods used to detect COVID-19 by taking a respitatory specimen (oropharyngeal swabs or nasopharyngeal sampling). But, this method takes a long time so another method is needed.Chest x-rays can be used as an alternative to detect specific symptoms related to COVID-19. Convolutional Neural Network (CNN) is widely used for disease detection based on medical images. In this research, a classification model for COVID-19 detection built with Simulated Annealing for optimize the parameters of depth layer, number of feature maps, filter size convolution layer, filter size of pooling, polling type, number of neurons fully connected, activation function and dropout rate. Based on the experiments that have been carried out, the most optimal CNN architecture model is the model using cooling rate SA 0.80 with F1-Score, Recall, and Accuracy values of 0.96, 0.97 and 0.95, respectively.

Keywords: Chest X-ray, CNN, Covid-19, Simulated Annealing