SUMMARY:

Effective screening of COVID-19 cases has been becoming extremely important to mitigate and stop the quick spread of the disease during the current period of COVID-19 pandemic worldwide. In this article, we consider radiology examination of using chest X-ray images, which is among the effective screening approaches for COVID-19 case detection. Given deep learning is an effective tool and framework for image analysis, there have been lots of studies for COVID-19 case detection by training deep learning models with X-ray images. Although some of them report good prediction results, their proposed deep learn ing models might suffer from overfitting, high variance, and generalization errors caused by noise and a limited number of datasets. Considering ensemble learning can overcome the shortcomings of deep learning by making predictions with multiple models instead of a single model, we propose EDL-COVID, an ensemble deep learning model employ ing deep learning and ensemble learning. The EDL-COVID model is generated by combining multiple snapshot mod els of COVID-Net, which has pioneered in an open-sourced COVID-19 case detection method with deep neural network processed chest X-ray images, by employing a proposed weighted averaging ensembling method that is aware of different sensitivities of deep learning models on different classes types. Experimental results show that EDL-COVID offers promising results for COVID-19 case detection with an accuracy of 95%, better than COVID-Net of 93.3%.