

Analisis akurasi metode Convolutional Neural Network (CNN) pada klasifikasi COVID-19 Pneumonia dengan pendekatan Pseudo-coloring Red Green Blue (RGB) menggunakan data Citra Chest X-Ray = Accuracy analysis of Convolutional Neural Network (CNN) methods on classification of COVID-19 Pneumonia with Pseudo-coloring Red Green Blue (RGB) approach using Chest X-Ray image

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Abstrak

Coronavirus Disease 2019 (COVID-19) pertama kali diidentifikasi di Wuhan, Thiongkok pada akhir Desember 2019. COVID-19 disebabkan oleh coronavirus baru yaitu The Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Sejak 11 Maret 2020, WHO secara resmi menyatakan pandemi COVID-19. COVID-19 ini menginfeksi saluran pernapasan manusia yaitu sel epitel alveolus paru-paru yang menyebabkan pneumonia. Dengan bantuan metode dari Deep learning yaitu Convolutional Neural Network (CNN) dapat digunakan dalam mendeteksi kasus COVID-19 melalui tanda-tanda pneumonia pada data citra Chest X-ray. Deteksi dini kasus COVID-19 sangat diperlukan sebagai langkah meminimalkan penularan dan mengurangi resiko kematian pasien. Oleh karena itu, penelitian ini membangun metode CNN transfer learning model DenseNet121, MobileNet dan ResNet50 dengan pendekatan pseudo-colouring (RGB) dalam mengklasifikasi kasus COVID-19 ke dalam tiga kelas yaitu: COVID-19 pneumonia, sehat dan viral pneumonia. Pendekatan pseudo-colouring (RGB) dilakukan pada tahap praproses dengan memanipulasi warna pada data citra Chest X-ray sebagai sarana untuk membantu meningkatkan hasil akurasi, presisi dan sensitivitas. Hasil evaluasi pada terbaik terdapat pada model DenseNet121 menunjukkan peningkatan akurasi total 99%, presisi total 99% dan sensitivitas total 99%. Pada model MobileNet menunjukkan peningkatan pada akurasi total 97%, presisi total 97% dan sensitivitas total 95% dan pada model ResNet50 menunjukkan peningkatan pada akurasi total 97%, presisi total 98% dan sensitivitas total 94%.

.....Coronavirus Disease 2019 (COVID-19) was first identified in Wuhan, China at the end of December 2019. COVID-19 is caused by a new coronavirus, namely The Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Since March 11, 2020, WHO has officially declared a COVID-19 pandemic. This COVID-19 infects the human respiratory tract, namely the alveolar epithelial cells of the lungs which causes pneumonia. With the help of methods from Deep learning, the Convolutional Neural Network (CNN) can be used to detect cases of COVID-19 through signs of pneumonia in Chest X-ray image data. Early detection of COVID-19 cases is important to minimize transmission and reduce the risk of patient death. Therefore, this study builds the CNN transfer learning model DenseNet121, MobileNet and ResNet50 with a pseudo-coloring (RGB) approach in classifying COVID-19 cases into three classes, namely: COVID-19 pneumonia, healthy and viral pneumonia. The pseudo-coloring (RGB) approach at the preprocessing stage by manipulating the colors in the Chest X-ray image data as a means to help improve accuracy, precision and sensitivity results. The evaluation results on the DenseNet121 model showed an increase in total accuracy of 99%, total precision of 99% and total sensitivity of 99%. The MobileNet model showed an increase in total accuracy of 97% , total precision of 97% and total sensitivity of 95% and the ResNet50 model showed an increase in total accuracy of 97%, total precision of 98% and total sensitivity of 94%.