ABSTRAK

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Program Studi : Fisika

Judul : KLASIFIKASI COVID-19 PADA CITRA X-RAYS MENGGUNAKAN DEEP LEARNING CNN (*CONVOLUTIONAL NEURAL NETWORK*)

Covid-19 (coronavirus disease 2019) kerusakan paru-paru yang memiliki gejala seperti SARS dan MERS yaitu penyakit pernapasan, gagal ginjal bahkan menyebabkan kematian. Covid-19 awal muncul pada desember 2019 di Wuhan, China dan WHO memasukkan penyakit ini dalam kategori KKMD/PHEIC pada Januari 2020. Telah dilakukan penelitian untuk memahami klasifikasi kerusakan paru-paru pada citra X-Ray menggunakan deep learning CNN yang ditimbulkan oleh wabah tersebut karena diperlukan mekanistik demi membantu permasalahan ini.Pertama penelitian menerapkan praproses thresholding median filter dengan nilai T 128 dan intensitas 256 untuk kualitas citra. Kedua menggunakan CNN untuk mengklasifikasikan citra berdasarkan kelas covid atau normal, mengetahui persentase kelas dan diagnosis jenis kelas citra yang diinput beserta visualisasinya. CNN terbagi menjadi 2 tahap yaitu ekstraksi citra (konvolusi, fungsi aktivasi, pooling) dan klasifikasi (fully connected). Model yang diterapkan yaitu model CNN sequential tensorflow. Jumlah citra yang digunakan sebanyak 94 citra. Dari 82 citra paru-paru dari kelas covid dan normal melalui beberapa tahap berdasarkan epoch serta ukuran piksel mendapatkan hasil maksimal saat ukuran piksel 175x175, epoch 50 dengan akurasi 100%. Dari hasil tersebut, 12 citra uji coba jika langsung menginput citra menggunakan piksel 175, 512,1024 diperoleh semua citra mampu mendeteksi kelas dari citra tersebut. Semakin besar nilai epoch dan ukuran piksel maka dataset mampu memecah citra menjadi lebih kecil sehingga memperoleh akurasi yang

lebih maksimal. Selain itu CNN metode sequential tensorflow dengan memanfaatk-
an praprocessing thresholding median filter mendapatkan hasil lebih baik daripada
penelitian sebelumnya. Oleh karena itu, sistem klasifikasi kelas citra x-ray meng-
gunakan CNN bisa menjadi peninjau ulang tim medis.

Kata Kunci : Covid-19, Thresholding, Median Filter, CNN, Tensorflow

ABSTRACT

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Title   :   *CLASSIFICATION OF COVID-19 ON X-RAYS IMAGES USING CNN DEEP LEARNING (CONVOLUTIONAL NEURAL NETWORK)*

COVID-19 (coronavirus disease 2019) damages the lungs and has symptoms like SARS and MERS, namely respiratory disease, kidney failure, and even death. Covid-19 initially appeared in December 2019 in Wuhan, China and included this disease in the KKMD/PHEIC category in January 2020. Research has been carried out to understand the classification of lung damage on X-Ray images using deep learning CNN caused by the outbreak due to mechanistic is needed to help with this problem. First, the research applies a preprocessed thresholding median filter with a T value of 128 and an intensity of 256 for image quality. Second, using CNN to classify images based on COVID or normal classes, knowing the percentage of classes and diagnosis of the type of image class that is inputted along with its visualization. CNN is divided into 2 stages, namely image extraction (convolution, activation function, pooling) and classification (fully connected). The model applied is the CNN sequential tensorflow model. The number of images used was as many as 94 images. Of the 82 lung images from the COVID and normal classes through several stages based on epochs and pixel size, the maximum results were obtained when the pixel size was 175x175, epoch 50, with 100% accuracy. From these results, 12 test images, if directly input the image using pixels of 175, 512, or 1024, are able to detect the class of the image. The greater the epoch value and pixel size, the greater the dataset is able to break the image into smaller ones so as to obtain maximum accuracy. Besides that, the CNN sequential tensorflow method

by utilizing a preprocessing thresholding median filter got better results than previous studies. Therefore, the x-ray image classification system using CNN can be a reviewer for the medical team.

Keyword : Covid-19, Thresholding, Median Filter, CNN, Tensorflow