ABSTRACT

MENTAL HEALTH DISORDER DETECTION THROUGH FACIAL IMAGES USING CONVOLUTIONAL NEURAL NETWORK (CNN)

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16/395999/PA/17340

Mental health disorder is often concealed due to social paradigms in some regions due to the impact of on one's well being and image. Therefore, many individuals conceal their mental disorders and leads to the worsening condition of their mental health.(Venkataraman and Paramswaran, 2018) Detection of mental illness proves to be difficult when concealed, but research by Ward and Scott (2018) implicates the possibility of performing detection on neutral faces. This research aims to create CNN models that implement transfer learning method with base models VGGFace2 and InceptionV3 due to the scarcity of dataset. The implementation of the program augments the data to create a dataset of 336 images from resizing, flipping, photometric transformation, and face averaging. The pretrained models are trained over 20, 30, and 40 epochs using Adam and Stochastic Gradient Descent optimizers using K-Fold validation scheme. The best models produced 0.9762 and 0.66 average accuracy for VGGFace2 and InceptionV3 respectvely. Finally, the research analyzes the models' decisions using LIME explainer library. The models expresses regions of interest on the area of the mouth, the eyes and and nose when predicting high tendency of mental disorder, while outer regions are considered to support prediction of low tendency of mental disorder.

Keywords : Convolutional Neural Network, VGGFace, InceptionV3, Mental Health Disorder Detection, LIME Explainer