A MODEL-BASED ON DEEP LEARNING FOR FEATURE EXTRACTION IN DEPRESSION LEVEL DETECTION

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ABSTRACT

Depression is a health problem that is usually overlooked, but can have a big effect on a person's performance. To prevent this, early detection of depression is needed through real- time face observation so that one's mood can be monitored. The system must be quite reliable when running on medium computer specifications. This system will use image processing and deep learning type artificial intelligence which has been successfully applied in various recognition and classification systems. One of the important things in detecting depression through the face is feature extraction. So far, feature extraction has been derived manually from psychological theories. In this research, modeling will be carried out to find feature extraction automatically using deep learning.

In this study the auto encoder method will be used which is one of the deep learning theories. The deep learning process that is carried out consists of several stages, (1) Collecting training data sets, (2) Pre-processing, (3) Making Auto Encoder and Decoder Algorithms (4) System Testing. The research will be conducted at the instrumentation laboratory, UNY Indonesia and the mechatronics laboratory, IIUM Malaysia. The research will be carried out for 6 months in 2 locations.

Automatic facial expression recognition has been applied in various fields, such as to determine customer satisfaction, determine students' mood in learning, and even as an early detection of depression. With the development of the CNN (Convolutional Neural Network) algorithm which has proven reliable for image recognition, facial expression recognition using this algorithm has also been developed. The problem with using CNN and other deep learning algorithms is determining the optimal architecture, which is a relatively small architecture with fairly reliable results. This study focuses on using an auto-encoder to obtain the optimal architecture using the FER2013 dataset. Experiments were carried out by manually varying the auto-encoder parameters, namely the kernel size, the number of kernels in the convolution layer and the dropout value. The results show that the optimal architecture is obtained using a 3x3 kernel and the number of feature maps in each convolution layer is 32, without using a dropout.

Kata Kunci: *Deep Learning, Feature Extraction, Depression Level Detection*