INTISARI

Deep learning merupakan algoritme pembelajaran yang dikembangkan berdasarkan struktur otak manusia disebut *neural network*. *Deep learning* digunakan untuk melatih suatu sistem sehingga mampu menghasilkan *output* berupa prediksi berdasarkan *input* yang digunakan untuk melatih sistem tersebut. *Deep learning* dapat digunakan untuk melatih sistem yang dapat mengolah *input* berupa citra dan menghasilkan *output* berupa prediksi dari objek yang berhasil dikenali oleh sistem disebut *object detection.*

Dalam penelitian ini, penulis mengusulkan pengembangan sistem deteksi objek menggunakan *deep learning* yang mampu untuk mengenali objek pada citra yang ditangkap kamera dan memberikan keluaran berupa prediksi objek yang dikenali. Proses deteksi dilakukan dengan memanfaatkan file yang tersedia di *repository* github *Tensorflow Object Detection API* untuk melakukan *re-training* model deteksi agar mampu mendeteksi objek baru, *re-training* dilakukan pada model deteksi MobileNet dan ResNet yang tersedia di *model detection zoo.* Penggunaan dua model deteksi dilakukan untuk menguji model deteksi mana yang lebih tepat digunakan pada *personal computer* yang digunakan untuk penelitian.

Hasil penelitian menunjukan bahwa sistem deteksi objek dapat bekerja dengan kedua model deteksi yang di *re-train.* Pengujian pada model deteksi menunjukan adanya perbedaan performa kedua model deteksi dari sisi akurasi dan kemampuan *personal computer* untuk menjalankan sistem. Model deteksi ResNet memiliki akurasi lebih tinggi dibandingkan model deteksi MobileNet. Tetapi, model deteksi MobileNet dapat bekerja secara *real-time* pada *personal computer* sedangkan model deteksi ResNet mengalami *lagging* ketika digunakan untuk proses deteksi pada citra.

Kata kunci : *Deep Learning, Neural Network, Object Detection, Tensorflow.*

ABSTRACT

Deep learning is a learning algorithm developed based on human brain structure often called neural network. Deep learning is used to train a system to be able to give output in the form of prediction based on the input used to train itself, Deep learning can also be used to train a system capable of processing input in the form of images and giving prediction of what object it detected from the image called Object Detection.

In this research, the writer proposes the development an object detection system using deep learning capable of identifying objects on images captured using a camera and give response in the shape of a prediction based on what object is detected. The detection process is done by using file provided in Tensorflow Object Detection API repository to re-train a detection model so it is capable of detecting a different object in an image, re-training is done on detection model provided in model detection zoo repository. The usage of two detection model is to test which detection model in order to find out which one is more suitable to be used on the personal computer used for the research.

The result of the research shows that the object detection system developed can be used with both detection models. Testing done on the detection model shows differences between the two model on the parameter of accuracy and capability of the personal computer to run the system. ResNet detection model has higher accuracy compared to MobileNet detection model. But, MobileNet detection model is able to be run without any problem meanwhile while running ResNet detection model, the personal computer faced an issue in the shape of lagging while it is being used to run the system.

Keywords : Deep Learning, Neural Network, Object Detection, Tensorflow.