CHAPTER 1

INTRODUCTION

1.1. Background

Until now, the Covid-19 virus has claimed a large number of victims. This causes a lot of losses, both economic losses, and other losses. On the other hand, the administration of the Covid-19 vaccine is still in progress and takes time. The best solution to this problem is the prevention of transmission.

Figure 1.1: Covid-19 Case Until Oct 19, 2021

Source : https://www.arcgis.com/apps/dashboards/bda7594740fd40299423467b48e9ecf6

Figure 1.1 shows that the covid cases are still going up and down. To prevent the spread of the Covid-19 virus, experts around the world have tried various ways. One way is to give an appeal for the use of health protocols in the form of the use of masks and social distancing. Unfortunately, not all communities responded and obeyed the appeal. It should also be realized that experts cannot fully monitor people who are active. The role of the general public such as business owners, security units, and other parties is very much needed in monitoring the use of these health protocols.

Computer vision technology can be very helpful in monitoring violations of the use of masks and social distancing. For this, an effective architecture is needed in detecting objects in the image.

1.2. Problem Formulation

1. How to improve the performance of "System for detection and recapitulation of health protocol violations based on computer vision technology that is integrated with websites and smartphone applications"?

2. Which architecture which more effective for mask detection? "Faster R-CNN ResNet50 V1 640x640" / "SSD ResNet50 V1 FPN 640x640 (RetinaNet50)" / "SSD MobileNet V2 320x320"?

1.3. Scope

1. This system uses "Faster R-CNN ResNet50 V1 640x640" / "SSD ResNet50 V1 FPN 640x640 (RetinaNet50)" / "SSD MobileNet V2 320x320" with 5000 number of steps & 8 batch size

2. This system only uses three classes (wear a mask, not wear a mask & wear a mask but wrong) for detection, with 853 images as the dataset

3. The detection system was trained and evaluated using Google Colab Pro

1.4. Objective

Previously, the researcher already developed and implemented the idea of a creative initiative "System for detection and recapitulation of health protocol violations based on computer vision technology that is integrated with websites and smartphone applications". The previous project focused on implementing the big idea of "system integration". Single Shot MultiBox Detector is the architecture used (SSD). To develop a similar system for better performance (as well as to contribute to the field of science, especially the field of computer vision), new and specific research is needed that focuses and aims to compare the performance of several computer vision architectures in the case of wearing a mask and social distancing. Through this research, the researcher wants to find out which architecture is more effective for detecting mask use cases and detecting distance guarding in terms of mAP (mean average precision) & AR (average recall)