

Val Accuracy	Val Loss	Epoch Position
84,38%	0,3980	29
84,03%	0,3494	30
83,33%	0,4028	25
83,33%	0,4243	24

The training done with batch sizes of 100 and 30 epochs was used to carry out this research. As seen in Fig. 9 and Fig. 10, Validation Accuracy has the score stagnant staying in the range of around 80% or more, while Training Accuracy keeps going more than 85%, it might be possible to achieve a score of more than 85%. After doing some tests to do more than 30 epochs the training accuracy starts dropping to 80% so leaving with Training Accuracy staying in the range of 80% to 85%. Because of this 30 was put as the last epoch for the chart. Validation Accuracy has an unstable score at epoch 0 to 15 with the range of 75% to 30% while Training Accuracy is constantly going up from epoch 0 to 15, unlike Validation Accuracy as shown in Fig. 10.



Fig. 9. Validation Accuracy Graph.



Fig. 10. Training Accuracy Graph.

#### IV. COCLUSION

There are many works of literatures that discuss road damage classification [22-24] and recognition [2, 4, 7, 17, 18, 25, 26] by using Convolutional Neural Network (CNN). However, this paper classified the road damage using the Siamese Convolutional Neural Network

(SCNN) for image classification with the help of a device called Hawkeye. Canny Edge was used for detecting and identifying damages, while the Gaussian Blur increased its efficiency. Despite the variety of brightness/lighting in the images, from bright to dark, this process still performed outstandingly at identifying the edge of damage without a problem. The picture still has their characteristic although a variety of brightness/lighting exists in the images. After performing image segmentation, an edge detection method is applied to get the damage characteristic. The SCNN will then process the result of edge detection and image segmentation for classification process. The architecture achieved 85,59% accuracy and 0,34% validation losses. By using the images with the same layout and position, the SCNN classifies more accurately than using random road damage pictures. However, it makes the test also have to be in the same layout and position. No issue was found when the test image is in the same position and layout as the training and vice versa. Even though having it were one kind of layout and position to point out precisely it is still fine since the picture input continuously has the same format and position due to the picture was taken by Hawkeye.

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