

ABSTRACT

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**DETECTION OF APPLE QUALITY USING DEEP LEARNING WITH
YOU ONLY LOOK ONCE v5 (YOLOv5) ALGORITHM**

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(xii + 41 + appendices)

Apples are a type of fruit produced by apple trees. Typically, ripe apples have red skin, but they can also be green or yellow. The selection of quality apples involves various factors, such as skin color, texture, aroma, density, and defects. Manual analysis can be complicated and prone to human error. The differences in quality between fresh and rotten apples can significantly impact taste, nutrition, food safety, and consumer satisfaction. Therefore, technology that applies a deep learning model using the YOLOv5 algorithm is needed to select high-quality apples. The dataset used consists of 978 images, with 520 images for Fresh Apples and 551 images for Rotten Apples. Two labels were assigned: Fresh_Apple and Rotten_Apple, with a training set of 682 images, a validation set of 196 images, and a test set of 100 images. The results obtained during model testing for Fresh Apples showed a Precision of 0.799, Recall of 0.914, and a Best mAP of 0.918. For Rotten Apples, the Precision was 0.873, Recall was 0.851, and the Best mAP was 0.901. These results indicate that the YOLOv5 algorithm has a very high accuracy and is popular among machine learning practitioners.

References (2020-2023)