

## **ABSTRACT**

### **ANALYSIS OF COFFEE BEAN ROAST MATURITY DETECTION BASED ON IMAGE USING YOLOv4 ALGORITHM**

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*Coffee seeds are a raw material in the manufacture of coffee products, before coffee beans are processed into a varied product, coffee seeds go through a roasting process, where the coffee seed is roasted to reduce the water content and obtain a matching color composition and flavor. In general, the maturity of coffee beans before processing has four different levels, including green, light roast, medium roast, and dark roast. In fact, determining the maturity of coffee bean roasting is a difficult thing to do manually while the color of coffee seeds is a very vital determinant, the difficulty that is often experienced is not all coffee makers or owners of coffee processing enterprises can determine the maturity of the coffee seed roasting, only a few people in particular coffee roaster who can determine the maturing of the seed coffee roast, although sometimes the coffee roaster still makes a mistake in determining its maturity so vulnerable to human error. Based on the phenomenon, the use of technology using deep learning methods can be a solution in detecting the maturity of roast coffee seeds. Deep Learning will automatically detect the maturity of roast coffee seeds using the YOLOv4 algorithm by comparing the model that has already passed the training stage with the coffee seed image so that it can reduce the occurrence of human error. The results of this research are that the Yolov4 algorithm is able to perform the detection of maturity rate of roasting coffee beans based on the image with the accuracy value of 100% with the loss value only touching the value of 0.081203 which proves that the algorithm can work well in carrying out the image-based roasting maturity detection.*

**Keywords:** *Coffee bean, Deep learning, Roasting, YOLOv4*