ABSTRACT

Ochratoxin A (OTA) is a toxin produced by fungi of the Aspergillus and Penicillium

species that can infect coffee beans. The presence of OTA can degrade the quality of

coffee beans and pose health risks to consumers. This study detects five types of

defective coffee beans contaminated with OTA damaged coffee beans, black coffee

beans, coffee beans infected with mold, sour coffee beans, and coffee beans

attacked by pests. In this final project, the author conducted detection of defective

coffee beans contaminated with OTA using the Detection Transformer (DETR) model.

The dataset used is a primary dataset created by the author, with images of OTA

contaminated coffee beans captured using two different methods: using a mini photo

box and without a mini photo box. The total number of images in this dataset is 2,693.

During model training, the author compared the performance of the DETR model with

the You Only Look Once (YOLOv5) model. The test results show that both models

were able to make accurate predictions in the mini photo box capture scenario, with

a mAP@0.50 score of 0.979 for DETR and 0.966 for YOLOv5. However, the test results

for the scenario without a mini photo box showed lower performance compared to

the mini photo box scenario. Nonetheless, both models still exhibited significant

errors or failed predictions in the defective coffee bean class, both in the mini photo

box and non mini photo box scenarios.

Keywords: Ochratoxin A, Object Detection, Transformer, Defective Coffee Beans.

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