

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.*