ABSTRACT

The storage of food items and packaged products in refrigerators often leads to spoilage and expiration due to users frequently forgetting and being lazy to check the stored food items and packaged products. According to Bappenas (Badan Perencanaan Pembangunan Nasional), Indonesia discards 23-48 million tons of food waste per year during the period of 2000-2019, causing an economic loss of Rp 213-551 trillion per year. To address this issue, a system is needed that can solve these problems, preventing users from consuming spoiled food items and expired packaged products while reducing household waste.

This research focuses on food detection using IoT-based machine learning, assisting users in maintaining the quality of food items and packaged products stored in the refrigerator. The designed system has several functions, such as food and product detection, notifying users of food items that are nearing spoilage or have already spoiled, as well as expired packaged products, and providing recommendations for alternative food items and packaged products. The detected food items include apples, watermelons, dragon fruits, tomatoes, mustard greens, and chili peppers with object detection accuracy of over 80%. The results of the object detection can be viewed within the designed application.

Keywords: IoT, MQ-135, object detection, Raspberry Pi 4, rotten