



جامعة النجاح الوطنية

An-Najah National University

كلية الهندسة | Faculty of Engineering

وحدة الجودة والاعتماد - مركز ABET

Quality and Accreditation Unit - ABET Center



Project Title: OliScan

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Abstract:

The olive industry is one of the most vital agricultural sectors, and maintaining the quality of olives before processing is essential to ensuring the production of high-quality olive oil. Traditional sorting methods rely mostly on manual labor, are time-consuming and prone to human error, often resulting in quality disparities. Therefore, this project aims to design and implement an automated olive sorting system that improves the accuracy, speed and efficiency of the classification process.

The importance of this project lies in its contribution to raising the quality of olive products, reducing human effort, and reducing loss. The system will sort olives in two main stages: first by size, then by color, with the ability to automatically identify and remove damaged olives and leaves.

The main objectives of the project are to develop an intelligent, reliable, and affordable machine capable of accurately classifying olives, improving production efficiency, and ensuring the maintenance of consistent quality standards.

The proposed system is designed around an integrated hardware setup that includes a camera module, an ESP microcontroller, and a Raspberry Pi to automate the olive sorting process. Olives are fed into the system through a funnel, falling onto a rotating circular disk where each olive is analyzed using a camera connected to the Raspberry Pi, which performs image processing to determine the color and size of each olive and to identify any damaged or unwanted ones. After processing, each olive is released into a small moving cart that transports it at a specific speed to its designated section. The system classifies the olives into four groups: large black, small black, large green, and small green. The Raspberry Pi communicates with the ESP, which controls the motors and the transport mechanisms that move the olives to their corresponding destinations. Operating under controlled lighting conditions, the system ensures accurate measurements and clear image capture. Through the integration of image processing via the Raspberry Pi and control operations through the ESP, the system efficiently automates the sorting of olives by size, color, and quality.

Although similar sorting systems exist for fruits and vegetables, the number of specialized olive sorting systems is small, especially in local markets. Hence, this project aims to bridge this gap by providing an automated and economical olive sorting solution that meets regional production needs.