FRUIT DETECTION FROM 3D POINT CLOUDS OF TREES

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ABSTRACT

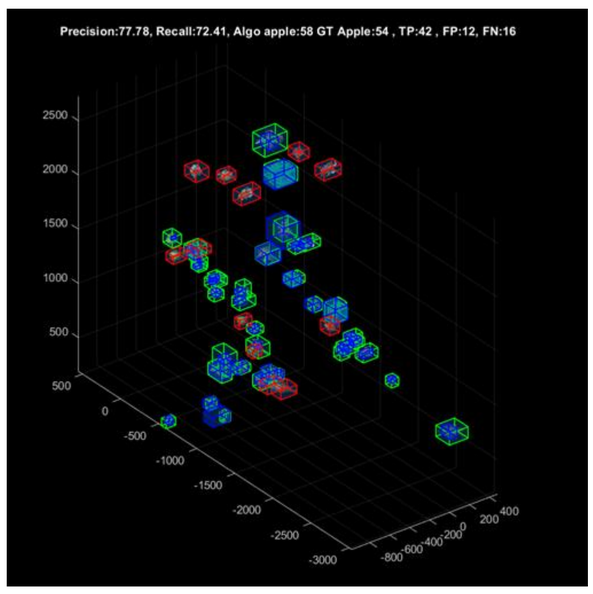
The primary objective of this study is to develop an accurate and reliable algorithm capable of identifying and localizing apples within complex 3D point cloud data acquired from orchard trees. To achieve this, a combination of data processing techniques and machine learning methodologies is employed. Initially, the point cloud data is preprocessed to remove noise and outliers, ensuring the accuracy of subsequent analyses.

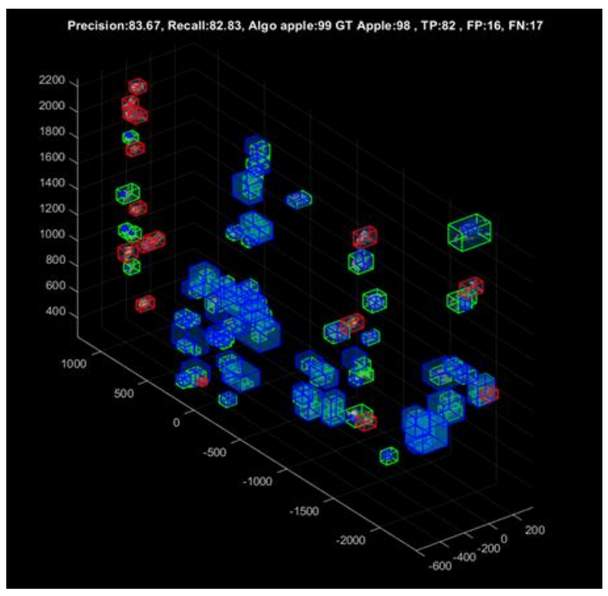
GOAL

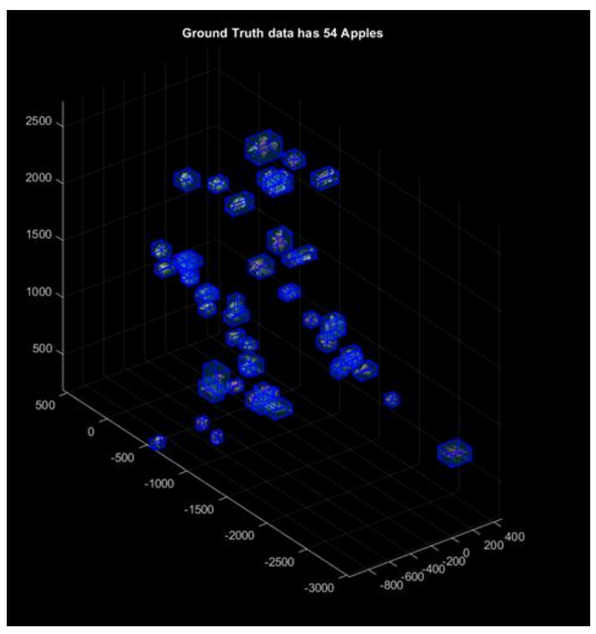
The agricultural industry is witnessing a growing demand for automated harvesting methods to improve efficiency and reduce labor costs. In this project, we propose a novel approach for detecting apples from 3D point clouds of trees using MATLAB, with the aim of taking a crucial step towards automated harvesting.

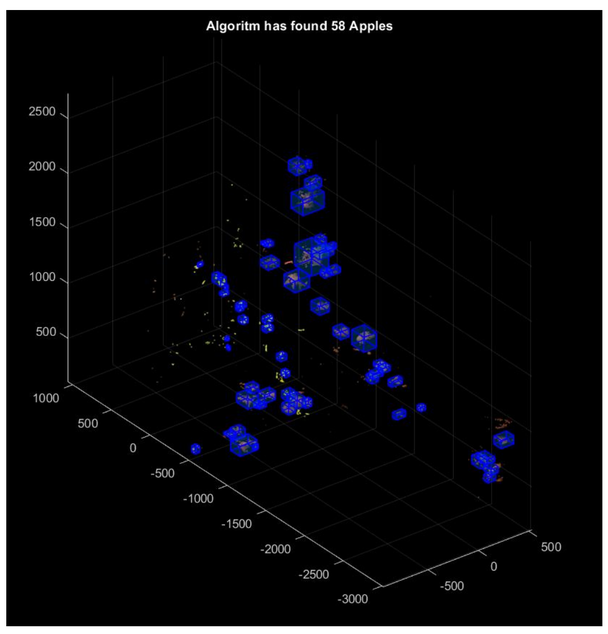
METHOD

- Image Acquisition
- Point Cloud Generation
- Point Cloud Labeling
- Color Thresholding
- Apple Detection
- Validation and Performance Evaluation

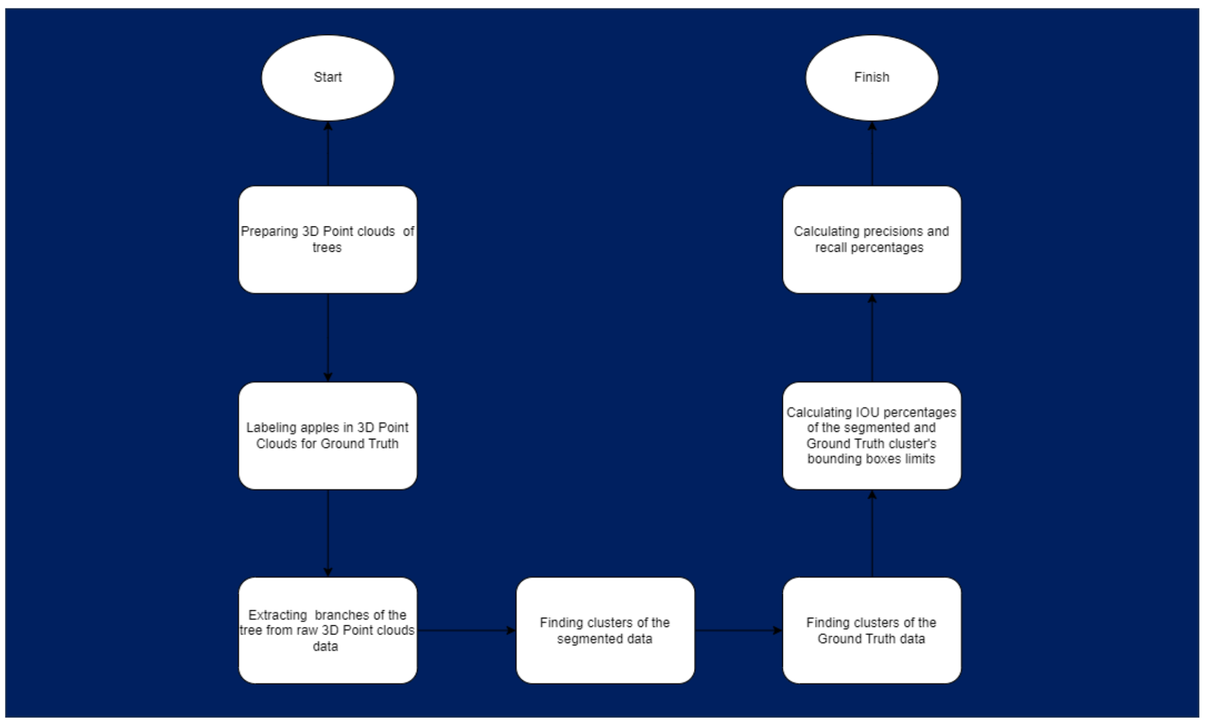




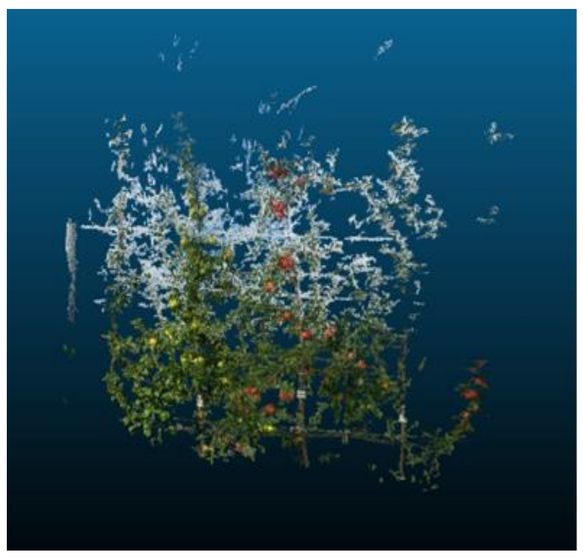


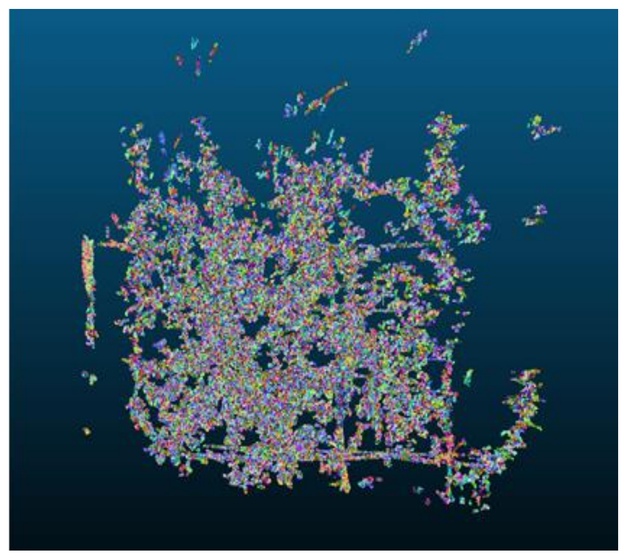


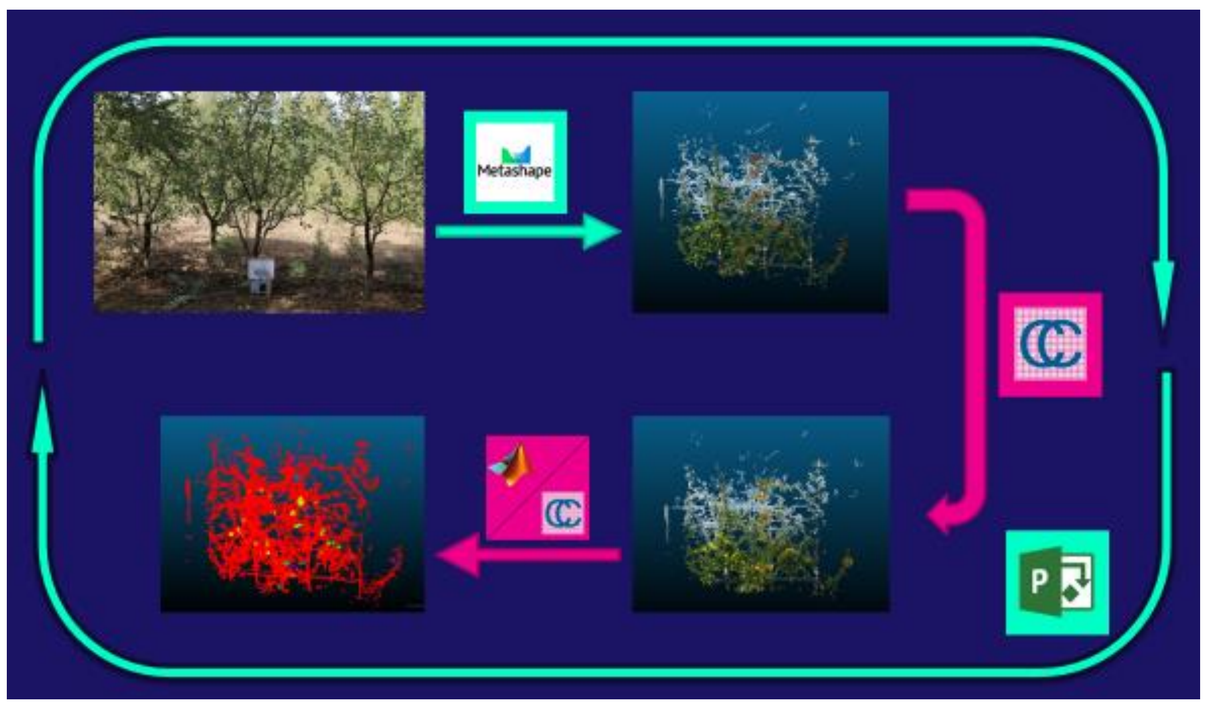
ALGORITHM FLOWCHART



CREATING DATASET







RESULTS

In conclusion, the project presents a promising approach for automated apple detection from 3D point clouds, laying the foundation for further advancements in automated harvesting technology. By combining image processing techniques, color systems, and point cloud analysis, this project contributes to the ongoing efforts to revolutionize agricultural practices and meet the increasing demands of the industry.