Review of: "Comparing YOLOv8 and Mask RCNN for object segmentation in complex orchard environments"

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Potential competing interests: No potential competing interests to declare.

I appreciate the effort put into the manuscript "Comparing YOLOv8 and Mask RCNN for object segmentation in complex orchard environments." However, I recommend major revisions for the paper to be considered for publication. Here are my detailed comments and suggestions:

Major Concerns:

Theoretical and Methodological Depth:

- The paper lacks a comprehensive theoretical framework explaining why these particular models (YOLOv8 and Mask R-CNN) were chosen for this study. A deeper dive into the specific attributes of these models that make them suitable for the task at hand is necessary.
- The methodology section should be expanded to provide more details on the implementation, including specifics about the training process, parameter tuning, and any preprocessing steps.

Comparative Analysis:

- While the paper presents a comparison between YOLOv8 and Mask R-CNN, it lacks a critical analysis of why certain differences in performance were observed. A deeper analysis of these models' behaviors in different scenarios within the datasets would add significant value.
- Consider incorporating a discussion on the trade-offs between the two models in terms of accuracy, speed, and computational resources required.

Dataset Description and Validation:

- More information on the datasets used, including their size, diversity, and any challenges they present, would be beneficial. This would help in understanding the models' performance better.
- It would be advantageous to validate the models on an independent dataset or through cross-validation to ensure the robustness of the results.

Real-world Applicability and Limitations:

- The paper should discuss the real-world applicability of these models in agricultural settings, including potential

limitations and challenges in practical deployments.
- Include a section on how these models could be integrated into existing agricultural systems and the potential impact on operational efficiency.

Comparisons with Other Relevant Work:

- A more extensive review and comparison with related work, especially recent studies using similar or alternative methods for object segmentation in agricultural settings, is needed.

Statistical Analysis:

- The results section would benefit from a more rigorous statistical analysis to validate the findings. This could include confidence intervals or hypothesis testing to ascertain the significance of the observed differences.

Figures and Tables:

- Improve the quality of figures and tables for better clarity and information conveyance. Each figure and table should be self-explanatory to a certain extent.

Minor Concerns:

Language and Grammar:

- There are several instances of grammatical errors and awkward phrasing that need to be addressed for better readability.

Referencing:

- Ensure that all references are current and relevant. Some references seem outdated or tangentially related to the paper’s core topic.

Workflow Chart Suggestion:

- A flowchart illustrating the entire process, from data acquisition to model training and evaluation, would greatly enhance the paper's clarity. This flowchart should detail each step in the methodology, including data preprocessing, model training, parameter tuning, validation, and performance evaluation.

Conclusion:

- The conclusions drawn in the paper need to be more nuanced, highlighting both the strengths and limitations of the study. A discussion on future work and potential areas for improvement would also be beneficial.

Final Note:

The paper presents a valuable study comparing two significant machine learning models for a critical application in precision agriculture. However, addressing the above concerns is crucial to elevate the paper's quality and ensure its contribution to the field is well-articulated and impactful.