Authors' Response to Reviewers' Comments

Dear Editorial Office and Reviewers,

Thank you very much for your excellent comments and feedback!

We have studied them very carefully and improved our manuscript according to them.

All comments of ours have been marked with red text in our manuscript.

Kindly,

Anwar & co-authors

Reviews comments

Reviewer 2:

Open Review

(x) I would not like to sign my review report
( ) I would like to sign my review report

Quality of English Language

( ) I am not qualified to assess the quality of English in this paper
( ) English very difficult to understand/incomprehensible
( ) Extensive editing of English language required
( ) Moderate editing of English language required
( ) Minor editing of English language required
(x) English language fine. No issues detected

	Yes	Can be improved	Must be improved	Not applicable
Does the introduction provide sufficient background and include all relevant references?	(x)	( )	( )	( )
Are all the cited references relevant to the research?	(x)	( )	( )	( )
Is the research design appropriate?	(x)	( )	( )	( )
Are the methods adequately described?	(x)	( )	( )	( )
Are the results clearly presented?	(x)	( )	( )	( )
Are the conclusions supported by the results?	( )	(x)	( )	( )

Comments and Suggestions for Authors

The authors studied the potential of LiDAR systems in assisting harvester operators, aiming to mitigate workload, reduce decision errors, and optimize the harvesting workflow. They used both synthetic and real-world 3D point cloud data sets for tree stem defect analysis, and developed two processes for tree stem and defect identification based on LiDAR technology and analyzed the challenges and advantages. The testing of the processes gave promising results and pointed directions for further development. I think the manuscript was well written and had novelty. It can be accepted for publication after minor revision. The following issues can be taken into consideration for improvement.

1. In the abstract, two sets of numbers (0.00229 & 0.772% and 0.000767 & 1.394%) between lines 22 and 23 are mutually contradictory. That is, 0.000767 is less than 0.99229, but 1.394% is greater than 0.772%. Additionally, I can't find 0.00229 in the text elsewhere.

Done. Here is our response to the issue raised above:

- We appreciate your attention to detail and your diligence in reviewing our manuscript. The apparent contradiction between the reported values of 0.00229 meters (m) and 0.77% for synthetic data, and 0.000767 m and 1.39% for real-world data, is indeed notable. We apologize for any confusion this may have caused and would like to provide clarification to ensure accuracy and coherence. In the abstract, we reported the Root mean square error (RMSE) between the predicted and actual deviations, along with the percentage of this error relative to the average of the predicted deviations. For the synthetic data, the RMSE was 0.00229 m, while the average of the predicted deviations was

0.29 m. Consequently, the percentage of the RMSE relative to the average predicted deviation is correctly calculated as 0.77%. Similarly, for the real-world data, the RMSE was reported as 0.000767 m, with an average predicted deviation of 0.054 m. Thus, the percentage of the RMSE relative to the average predicted deviation is accurately computed as 1.39%. We assure you that these values are consistent with our analysis and have been carefully validated. Once again thank you.

- The value 0.00229 is also referenced in the first version of the manuscript, specifically on page 11, line 425. And the new version of the manuscript is on page 12, line 484.

2. Line 232: generation can be removed. Line 267: “1024, it.” It is wrong?

Done. In response to feedback from another reviewer (4), the entire paragraph on line 232 has been removed, leading to the removal of the word "generation" as well.

Concerning line 267, we have included the following addition on page 8 lines 321 - 326:

“The LiDAR sensor utilized in our study boasts a precision characterized by a vertical channel count of 64 and a horizontal resolution of 1024. It is noteworthy that this sensor provides three distinct horizontal configurations: 512, 1024, or 2048. Given our experimental objectives and requirements, we selected the 1024 configuration due to its consistent performance and its capacity to yield satisfactory results within our experimental framework.”

3. Line 340-346: I think these paragraphs and Figures can be removed, because the following text has described the process clearly.

Done. We removed the mentioned paragraphs and figures thus streamlining the document. Thank you!

4. Line 397: Equation (8) is better to remove after equation (7).

Done. We relocated Equation (8) to follow the RMSE% equation. Equation (8) is now denoted as Equation (9) and can be found on page 11, line 458.

5. Line 424-426: RMSE values need to have a unit (m?), and RMSE% values are accurate enough to preserve two decimal digits, such as 0.77% and -0.59%. Same to the values in the whole text and the abstract.

Done. We have included the unit "m" for the RMSE values and maintained two decimal places for precision.

6. Fig.9: The small green points are not bright enough, which need to be so bright as the Fig.8.

Done. We increased the point cloud point size to improve the visibility of Fig.9.

Please note that Fig.9 is now denoted as Fig.7 can be found on page 13 line 491.

7. Line 456-462: There is a little bit regret, because the accuracy assessment is only based on three measured values. If it is based on more than 10 even 30 measured values, it would be fine. I suggest point out this limitation in the discussion.

Done. In the Discussion chapter, we added the following on page 15 lines 579 -587:

“While the accuracy assessment of our model yielded promising results, they are based on a relatively small sample size. As highlighted in the Results section, the assessment was based on a modest dataset comprising only three measured values. Although these data points provided initial insights into the model's performance, a broader validation set, ideally consisting of more than 10 or even 30 measured values, would offer a more reliable evaluation of its prediction capability. The limited sample constrains the generalizability of our findings and warrants caution in interpreting the accuracy of the model. Future studies should collect a larger and more diverse dataset to validate and refine the model further.”