

This research represents a somewhat incremental but important step in advancing hail estimates and provides innovative development to address several challenges and make improvements. While building on the work of HailPixel (Soderholm et al., 2020), the authors' key contributions are: (1) a demonstration that the image processing pipeline can be reduced to only applying a region-based convolutional neural network (R-CNN) to an orthomosaic, both simplifying the processing and increasing the accuracy, and (2) an analysis of hailstone melting rates, which is critical to accurately understand any post-event hail observations, using successive flights. Furthermore, the data collection procedures presented continue to refine strategies for the successful interception and observation of hail events, which is non-trivial. There are some details of procedures and implementation that are not fully optimized but seem within reason for initial experimental purposes. Overall, the greatest limitation of this work is the very limited data set (a single event), which makes it difficult to understand the broad applicability of some specifics (for example, the R-CNN model as-trained or loss of accuracy due to lighting conditions). However, it represents valuable proof-of-concept with novel approaches and would serve as a steppingstone for future work. The techniques applied lend themselves easily to such future development and expanded data collection, relying only on commercial-off-the-shelf equipment and consumer-grade computing equipment.

Comments/Questions/Suggestions:

1. Line 56 "lake" -> "Lake"
2. Line 62 "for the area within a distance of less than 1 km from the survey area" -> "for the area within 1 km of the survey area"

3. Lines 69-70 "a high resolution" is ambiguous, what is the resolution? (It is given on Line 126.)

Similarly, Line 53 "giving a ground sampling distance (GSD) of 1.5 mm px<sup>-1</sup>" From what altitude of flight? (It is given on Line 137.)

It would be nice to have all of this information presented in a single statement or at least the same section (e.g. something like "A ground sampling distance (GSD) of 1.5 mm px<sup>-1</sup> was achieved flying at an altitude of 12m with a 45 MP camera."), similar to how it appears in your abstract. Perhaps even a flight characteristics table would make referencing this comparatively in future work easier. This is not a critical point as all the information is presented, but as a matter of preference could be easier to consume.

4. Line 91 "better", Is it possible to present a quantified comparison for this?
5. Section 2.2. Did you have any guidelines for acceptable flight conditions? E.g. Maximum wind speed/gusts, etc. It is clear you were trying to get off the ground as soon as possible

after an event, but given the criticality of timing, it would be helpful to know if there were any additional limitations.

6. Line 154 “ISO-25600” This is very high and likely introduces a fair bit of noise. This is explained later on Line 428, but I think it would be useful to include the reasoning for such a high ISO in the earlier section. Could results be improved by running a slightly slower shutter and lower ISO? Is wind playing a role in image blur in addition to forward flight? These may be topics for future work, but it would be nice to see them acknowledged if applicable.
7. Line 157 GPS Error: Are you using RTK correction? The error value suggests not, even though your drone supports it, and you call this out explicitly (Line 127). There’s obviously a substantial challenge in deploying an RTK base station and establishing a usable dilution of precision in the timeframes you require. However, it would be worth mentioning these limitations and maybe potential alternatives, such as NTRIP (Networked Transport of RTCM via Internet Protocol) services, if available, especially given the discussion in Section 3.3 of lacking positional consistency without ground references such as the soccer center circle.
8. Line 297 “equal axis lengths”. From your bin definitions, this actually represents aspect ratios  $>0.9$ , not necessarily exactly equal.
9. Figure 5(d) doesn’t make sense until you get to Line 300. I understand why it makes sense to have with (a)-(c) as a single figure, but it may be worth noting the section it applies to in the caption.
10. Lines 306-309 might be more easily digested as a table, but that’s more a preference.
11. Section 4 – First paragraph could maybe go in intro, feels a little out of place here, but again more of a preference.
12. Line 367 “as published in e.g. Knight (1986); Shedd et al. (2021)” -> “as published in Knight...”
13. Table 3 – Would it be possible to make this as a time series plot, T on left axis, RH on right (or similar)? It is more difficult to pick out the trends looking at a table. Noting the flight times as vertical lines or highlighted sections would further help in understanding the overall timeline of events.
14. Line 385 “what might effect” -> “which might affect”

Overall largest concern: Is this repeatable and generalizable? Your results are based on a single event used for training, validation and testing. Very interesting work though and sets the stage for future research that can begin to fine tune and hopefully more extensively validate these types of analyses.

Other suggestions for potential future research:

(No expectation of these for this publication but curiosities that may be of interest to the authors.)

- Integration of thermal imagery. Even with low resolution, the integrated pixel values could provide useful information. By using the surface temp in areas with high probability and confidence of not having hail present as a background, you could use the differentials of other pixels to help include or exclude potential hailstones in conjunction with RGB techniques.
- Utilizing SfM result and applying R-CNN directly to mesh or point cloud rather than 2D orthomosaic. This would obviously require more computing power, but it would be interesting to see how it changes performance in 2D visually challenging environments (like taller grass).