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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Usability of aerial video footage for 3D-scene reconstruction and structural damage assessment" *by* Johnny Cusicanqui et al.

Anonymous Referee #1

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The paper is well written and interesting, as it goes through and evaluates different approaches for automated recognition of damage-related features based on rapidly available imagery datasets, for an effective post-disaster structural damage assessment.

The topic of the paper is interesting since it explores the potentialities of using rapidly collectable image datasets provided by video surveys, that are normally performed immediately after the occurrence of disasters in built-up areas. The difference between the results obtained using conventional photo dataset (nadir and oblique) and those obtained using video frames, along with advantages and drawbacks of each approach are clearly explained and supported by valid and exhaustive statistics. This research can represent a good starting point for further studies mainly focused on the optimized

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use of video frames not only for rapid SDA but, with the advent of new 4K (or more) resolution video cameras, even for nearly-real time ground modeling. However, there are some minor corrections that I can suggest to the authors, to make the paper possibly more clear and self-explanatory.

The results are sufficient to support the interpretations and the conclusions, nevertheless a few points need to be further clarified: 1) Probably reducing the frame redundancy using the WFS for video data can generate a lack of important photos, needed for an accurate Point Cloud calculation. For that reason, the video results with WFS are generally worse than the RFS. Maybe the WFS method is not appropriate in this case because the photos selected as good were in a non-optimal position. Is clear that the results of a Point Cloud generation are strongly related to the overlap and sidelap percentage between photograms. Maybe with different rules for WFS the results could be even better than using the RFS, even if the latter method is certainly faster. 2) Considering 3D Internal Accuracy assessment. The authors use planar fitting as a method to assess the accuracy of the resulting 3DPCs. It seems that only one planar object was used to perform this analysis. Maybe, considering more planar objects preferably equally distributed, for example, with respect to shaded and well-lighted areas or central or peripheral position could lead to more robust conclusions. 3) Considering 3D External Accuracy: it is not clear how the distance between each 3DPC and the reference one is considered. Is it a mean distance value, calculaded over the entire extent? Is it an average value of the distance calculated in correspondence of reference objects or areas? Moreover, how the presence/absence of GPS-measured Ground Control points can affect the final accuracy and usability of the results?

Corrections needed in the text:

Page 11, Line 2: replace “determining” with “determine”. Page 16, Caption figure 10: replace “doted” with “dotted”. Page 18, line 22: add “using” between “obtained” and “the”.

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