

Interactive comment on “UAV-based urban structural damage assessment using object-based image analysis and semantic reasoning” by J. Fernandez Galarreta et al.

Anonymous Referee #2

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This paper presents an Interesting ‘semi-qualitative’ use of image data and analysis techniques to assess building damage by earthquakes. It makes use of relatively new remote sensing/image analysis techniques such as 3D point clouds and Object Based Image Analysis. The results of the image analysis approaches are judged by an expert panel and assessed with basic accuracy assessment techniques.

A major weakness of the paper is the limited number/range of images that were used to test the image analysis approaches (i.e. the 3D point cloud and the OBIA damage delineation rule set). Also more work should have been done with the per building damage scores or even façade based scores. Currently the expert knowledge seems

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to be accepted without discussion. This turns out to be very variable, as one would expect. I think a strength of the presented approach is that it can overcome at least some of the subjectivity of the 'expert' judgement. More effort should have been put in trying to compare the 'expert' and OBIA based evaluations of the building damage. Perhaps an ordering of images in levels of damage severity by both expert opinion and OBIA quantifications. It is also a bit annoying that a lot of the information regarding the expert assessment requires access to a previous publication. A clear statement should be included as to what exactly the difference is between the two publications, as essential detail is missing from the current text.

No information is given on how/why these images were used/selected.

More detail on the OBIA rulesets used would be helpful.

The fact that the assessment of point clouds also requires expert judgement is not sufficiently stressed. It is very likely that the approach is prone to misinterpretations.

The use of the term 'features' is confusing. It is used to describe both OBIA classification 'features' and damage 'features'. Try using another term for the latter.

Page 5610, line 24: More info on the events would be helpful. How many images were taken from each site? P. 5611, line 1: Unclear sentence. P. 5612, line 12: ...The expected outcome was the possibility to visually identify D4 and D5 damage elements from the z-component of the 3D point cloud. p. 5613, line 1: More justification/detail need on the image 'selection'. Why only eleven? What criteria were used for their selection? Which sites were they taken from? What area/how many buildings do they include? Line 21: Unclear sentence. Line 28: Rather vague, please, provide numbers. p. 5614, line 14: deeper => more detailed. p. 5615, line 6: your => our? Line 7: unclear procedure. p. 5618, line 13/14: An assessment of this would be better done using a with/without OBIA damage mapping. Not sure how the current approach shows whether or not OBIA is helpful in the damage assessment (other than through subjective opinion of the experts). Last paragraph: I think this is an over-confident

statement. To be able to suggest this you should at least have run some test and show the quantitative results of these, otherwise it should not be stated like this. p. 5619, line 12: What kind of approach was used to develop such a ruleset? p. 5621, line 2: Were the experts aware that they could expect to see undamaged structures? If not this may explain why they were least sure about their judgement.

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