Second Response to Referee #2

We acknowledge Referee #2 for his comments. Please kindly find our response below and the updated version of the manuscript as an attached file.

GENERAL COMMENTS:
New paragraphs, which were added after revision, should be reviewed to improve language:

AUTHOR'S RESPONSE:
As suggested by the referee, the new paragraphs were revised.

SPECIFIC COMMENT:
Page 2, lines 8-12: it is unclear what exactly was suggested. Which features were extracted and what did they propose doing with them?

AUTHOR'S RESPONSE:
We have extended the summary of Schweier and Markus (2006)'s paper. It includes now the proposed features and the purpose of their use.

CHANGE IN MANUSCRIPT:
See Page 2 Line 9-15 (text in red in the updated manuscript):
"Schweier and Markus (2006) pointed out that airborne light detection and ranging (LiDAR) data can be used to classify collapsed buildings using the following geometrical features of a building extracted from LiDAR data: the height change from the initial one, the reduction of the total volume, the footprint borders, the inclination of the structure, the debris spread outside the footprint, the additional covered area outside the footprint, and the damage situation of the roof. They proposed a modification of the previous damage classification method (Okada and Takai, 2000) using these geometrical features. Although they suggested the use of airborne LiDAR data in extraction of collapsed buildings, applications to real cases were not provided."

SPECIFIC COMMENT:
Page 3, lines 3-4: the sentence "The detection of collapsed building…" seems redundant, and is ill phrased.

AUTHOR'S RESPONSE

The mentioned sentence has been rephrased.

CHANGE IN MANUSCRIPT:

Page 3, Line 6-7 (text in red in the updated manuscript):

"Building collapse is still the main cause of casualties and hence its prompt recognition is crucial for search and rescue operations."

SPECIFIC COMMENT:

Page 6, lines 22-25: I think that an equation will be of help here. It is unclear what the authors refer to in respect with parameter C, and if the purpose was to clarify SVM, it was missed here.

AUTHOR'S RESPONSE

Following the referee's comment, a set of mathematical expressions were added to clarify from where the parameter C comes.

CHANGE IN MANUSCRIPT:

Page 7 Line 1-5 (text in red in the updated manuscript):

"For a linear kernel SVM, the vector $\mathbf{w}$ perpendicular to the decision plane is defined by the following expression:

$$\mathbf{w} = \sum_i \alpha_i y_i \mathbf{x}_i \tag{10}$$

where $\mathbf{x}_i$ is a training vector that contains the three parameters (ΔH, σ and r), y_i represent the class that can be either 1 or -1, and the coefficients α_i are obtained by solving the following problem:

$$\min_{\boldsymbol{\alpha}} \left(\frac{1}{2} \boldsymbol{\alpha}^T \mathbf{Q} \boldsymbol{\alpha} - \mathbf{e}^T \boldsymbol{\alpha} \right) \tag{11}$$

$$Q_{ij} = y_i y_j \left(\mathbf{x}_i \cdot \mathbf{x}_j \right) \tag{12}$$

$$0 \le \alpha_i \le C, \; i = 1, \ldots, n \tag{13}$$

where e is a vector whose elements are all ones, C is the upper bound and is used as a regularization parameter."