Dear Editors and Reviewers:

Thank you for your letter and for the editors and reviewers' comments concerning our manuscript entitled **"Landslide susceptibility evaluation of BO-CNN Gengma seismic zone considering InSAR deformation".** Those comments are all valuable and very helpful for revising and improving our paper. With these comments in mind, we made careful revisions to the manuscript.

Our replies to reviewers' comments from the first version are presented one by one, and the revision in response to reviewers' comments and suggestions as well as the new improvements are marked in red in the revised manuscript. We hope that this revised manuscript will meet the publication requirements of **Applied Sciences** after incorporating the suggestions of the expert reviewers.

Sincerely,

Deng yunlong

Zuo Xiaoqing et al.,

1.Please split this into smaller sentences. It is difficult for the reader to follow.

Response:

Thank you for your careful review and constructive comments.

According to your comments, we have broken it down into smaller sentences and the changes are as follows:

Page 1, line 20 ~ line 29:

The accuracy of the model was evaluated by using three indexes, including the ROC curve, the AUC value, and the FR value. Specifically, the ROC curves of PSO-SVM, BO-RF, and BO-CNN were close to the upper-left corner. Moreover, the AUC values were computed as 0.9388, 0.9529, and 0.9535, respectively, and the FR value of landslide in the high susceptibility area of BO-CNN reached up to 14.9 and exceeded

those of PSO-SVM and BO-RF, respectively. Besides, the mentioned values of the SVM and BO-RF models were 4.55 and 3.69 higher. The experimental results indicated that compared with other models, the BO-CNN model used in this study had a better effect in landslide susceptibility evaluation, and the research results are of great significance to the disaster prevention and mitigation measures of local governments.

2.Maybe something wrong with the total number. You mention a total of 1,659 cases and then 4,810 landslides + 1,797 avalanches, etc. The figures do not add up. Please check also the statement "about two-thirds"

Response:

Thank you for your careful review and constructive comments.

According to your comments, we have checked and corrected the value of this text.

Page 2, line 47 ~ line 51:

The statistical yearbook published on the official website of the National Bureau of the china Statistics 2021 suggested that 1,659 cases of geologic hazards were reported nationwide in 2020, higher than that data in 2019, with 4,810 landslides, 1,797 avalanches, 899 mudslides, as well as 183 ground collapses. The above result indicated that nearly 63% of the geologic hazards originate from landslides.

3.One reference from 1995 is not enough. Please add some more that are more recent. Some examples are:

Tzouvaras, M. Statistical Time-Series Analysis of Interferometric Coherence from Sentinel-1 Sensors for Landslide Detection and Early Warning. Sensors 2021, 21, 6799. https://doi.org/10.3390/s21206799

Moretto, S.; Bozzano, F.; Esposito, C.; Mazzanti, P.; Rocca, A. Assessment of Landslide Pre-Failure Monitoring and Forecasting Using Satellite SAR Interferometry. Geosciences 2017, 7, 36.

Tzouvaras, M.; Danezis, C.; Hadjimitsis, D.G. Small Scale Landslide Detection Using Sentinel-1 Interferometric SAR Coherence. Remote Sens. 2020, 12, 1560.

Jung, J.; Yun, S.-H. Evaluation of Coherent and Incoherent Landslide Detection

Methods Based on Synthetic Aperture Radar for Rapid Response: A Case Study for the 2018 Hokkaido Landslides. Remote Sens. 2020, 12, 265.

Response:

Thank you for your careful review and constructive comments.

According to your comments, we have illustrated the relevant literature cited in this passage.

Page 2, line 55:

Moretto, S.; Bozzano, F.; Esposito, C.; Mazzanti, P.; Rocca, A. Assessment of Landslide Pre-Failure Monitoring and Forecasting Using Satellite SAR Interferometry. Geosciences 2017, 7, 36.

Tzouvaras, M.; Danezis, C.; Hadjimitsis, D.G. Small Scale Landslide Detection Using Sentinel-1 Interferometric SAR Coherence. 2020, 12, 1560.

Tzouvaras, M. Statistical Time-Series Analysis of Interferometric Coherence from Sentinel-1 Sensors for Landslide Detection and Early Warning. Sensors 2021, 21, 6799.

4.You are missing from your review the limitations that exist in relation to the magnitude/speed of landslides and radar wavelength. For more information see:

itations that exist in relation to the magnitude/speed of landslides and radar wavelength. For more information see:

Wasowski and Bovenga, 2014

https://doi.org/10.1016/j.enggeo

Tzouvaras et al. 2020

https://doi.org/10.3390/geosciences10060236Wasowski and Bovenga, 2014

https://doi.org/10.1016/j.enggeo.2014.03.003

You are missing from your review the lim

Manconi et al., 2018

https://doi.org/10.3390/rs10050672

Response:

Thank you for your careful review and constructive comments.

According to your comments, we add the slippery slopes to the introduction with amplitude/velocity and radar wavelength related narratives and explain the descriptions, with modifications as follows:

Page 2, line 69 ~ line 76:

Manconi A combined Digital Image Correlation with SAR amplitude information from Sentinel 1 and Sentinel 2 to accurately map landslide areas with large deformation [15]. Tzouvaras, M utilized the advantage of Sentinel 1 satellite in acquiring the surface deformation and combined it with Coherent Change Detection to accurately detect the areas affected by the Landslide hazard affected areas. The result suggested that longer wavelength L-band and P-band SAR images should be selected in areas covered by vegetation [16,17].

Manconi A, Kourkouli P, Caduff R, et al. Monitoring Surface Deformation over a Failing Rock Slope with the ESA Sentinels: Insights from Moosfluh Instability, Swiss Alps[J]. Remote Sensing,2018,10(5).

Tzouvaras, M.; Danezis, C.; Hadjimitsis, D.G. Small Scale Landslide Detection Using Sentinel-1 Interferometric SAR Coherence. Remote Sens. 2020, 12, 1560.

Tzouvaras, M.; Danezis, C.; Hadjimitsis, D.G. Differential SAR Interferometry Using Sentinel-1 Imagery-Limitations in Monitoring Fast Moving Landslides: The Case Study of Cyprus. Geosciences 2020, 10, 236.

5.Change the equation to a higher quality one. You can use Mathtype or any other software instead of copying a screenshot here

Response:

Thank you for your careful review and constructive comments.

According to your comments,we re-edited the formula using Mathtype and the formula is as follows:

Page 4, line 172:

$$z^{*} = \arg\max_{z \in Z} f(z), \tag{1}$$

6.Use small letters

Response:

Thank you for your careful review and constructive comments.

According to your comments, we have changed some of the capital letters of the names of people to lower case.

Page 5, line 194:

In 2001, Breiman L and Cutler A introduced Random forest for the first time with .....

7.What is 3S technology?

Response:

Thank you for your careful review and constructive comments.

According to your comments, in order to have a clear idea about the 3S technology, we have explained about the 3S technology.

Page 5 ~ page 6, line 217 ~ line 219:

In this study, we adopted "3S" technology ("3S" is the collective name for remote sensing (RS), geography information systems (GIS), as well as global positioning systems (GPS)),

8.What is the "line of equations" factor? You do not describe it in the previous section

Response:

Thank you for your careful review and constructive comments.

According to your comments, we apologize for not describing Figure. 5k throughout the experiment, but due to our carelessness, this section was omitted from the previous manuscript. This revision identified the problem and therefore added it. We hope this change meets with your approval, and we again apologize for our carelessness and sincerely thank you for pointing out this problem.

Page 10, line 322 ~ line 326:

Earthquakes (Figure. 5k) can cause sudden loss of equilibrium of geotechnical bodies and collapse and landslides. They can also cause slopes to be in a state of limiting equilibrium or to form landslide hazards and dangerous rock bodies. Thus, geologic hazards can easily be induced or aggravated in the vicinity of zones of strong seismic activity.

9.It is not clear to me how the weights were calculated. Please explain this in detail

Response:

Thank you for your careful review and constructive comments.

According to your comments, we apologize for grading FR values mainly for evaluation factors in the table, but due to our carelessness, this section was incorrectly described in the previous manuscript. This problem was identified in this revision and therefore it has been corrected. We hope this change meets with your approval, and we again apologize for our carelessness and sincerely thank you for pointing out this problem.

Page 14, line 409:

Table 3 Evaluation factor grading FR values