Detection of rail surface defects based on CNN image recognition and classification

RSN-2017-0547

Ming Xiao, Hua Xiao, Gang Xiao, Hong Xiao

General response: We are pleased to resubmit the revised version of our paper entitled " Detection of rail surface defects based on CNN image recognition and classification". We sincerely thank the editor and all reviewers for your careful reviews. These comments are all valuable and very helpful for revising and improving our paper, as well as significant to guide our research. The reviewers' comments are laid out below in *italicized font* and specific concerns have been numbered. Our responses are given in normal font and changes/additions to the manuscript are given in blue text. We have studied the comments carefully and made corrections based on reviewers' comments. We hope the revised version is now suitable for publication and look forward to hearing from you in due course.

Catalog:

1. Responses to Reviewer 1

We are very thankful to this reviewer. His/her comments definitely help to promote the quality of our paper. We address every comment carefully and explain the corresponding changes in the manuscript. Details are shown below.

Reviewer 1 Comment 1

The written English needs to be improved. There are also many errors, e.g.,
(1) In the last sentence in Page 1, "the" should be "The".
(2) In the last sentence in Section 2.3, "section" should be "Sections".
(3) Below Equations (4), (8) and (9), "Where" should be "where" and there should be no indent.

Response:

Thank you for pointing out the errors in our manuscript and the problem of our English writing. We all agree with this comment, and we feel very sorry for the existence of the errors.

….

Errors mentioned in this comment have been revised as follows:

…

Reviewer 1 Comment 2

The authors should address the following problems. Is the "complex dataset" used in the experiments simulated or measured? If the data come from the real environment, (1) how to deal with incomplete data and outliers, and (2) how to distinguish between "inconsistent" features and "incomplete" features?

Response:

Thank you for the questions on the dataset. Your questions are indeed valuable for us to perfect our paper. Here are some replies of us and the relevant changes in the revised paper.

….

To explain why the incomplete data and outliers are not considered, some contents are added in the revised paper. Details are shown as follow:

…..

2. Responses to Reviewer 2

We are thankful to this reviewer. His/her comments concerning the writing and experiments will definitely help to improve the quality of the paper. Below are the answers to each specific point.

Reviewer 2 Comment 1

The second last line of Section 2.3-Our Proposal says: "Efficiency and accuracy are expected to be improved meanwhile". It was not clear in the paper how the efficiency of the classification was improved. Could the authors comment on that?

Response:

Thank you for the reviewer's question. Your doubt is valuable for us to improve our paper.

……

Reviewer 2 Comment 2

Section 5: The dataset was split according to a 7:1:2 ratio. Have the authors tried different ratios of training, validating and testing to investigate the accuracy? Was this is this the optimal ratio to avoid overfitting of the radar emitter data?

Response:

Thank you for the question on the dataset splitting. Your question guides us to think more about the experiments. It is valuable and helpful.

……

3. Summary of modifications

(1) According to the comments from the reviewers, we have checked the manuscript several times. Errors are corrected and the structure of the paper is modified. Plenty of work has been done on this.

(2) A colleague who is good at English is invited to polish the English writing. Some sentences in the paper are rewritten to express the key points clearly. Many words and phrases are replaced with precise ones.

(3)

(4)

(5)

4. References

[1] Lecun, Y., Bottou, L., Bengio, Y., et al.: 'Gradient-based learning applied to document recognition', Proceedings of the IEEE, 1998, 86, (11), pp. 2278-2324

[2] Russakovsky, O., Deng, J., Su, H., et al.: ' ImageNet Large Scale Visual Recognition Challenge', International Journal of Computer Vision, 2015, 115, (3), pp. 211-252

[3] Sergios, T.: ' Neural Networks and Deep Learning ', 2015

[4] Hinton, G., Srivastava, N., Krizhevsky, A, et al.: ' Improving neural networks by preventing co-adaptation of feature detectors', Computer Science, 2012, 3, (4), pp. 212-223

[5]

[6]