

Institute of Genomics and Bioinformatics

National Chung Hsing University

Taichung, Taiwan 40227 ROC

March 21, 2021

Academic Editor

Artificial Intelligence in Gastroenterology

Dear Academic Editor,

Thanks for your careful review for my manuscript (Manuscript NO.: 63358, Review). I really appreciate your help and the comments from both reviewers. After carefully reading the comments raised by the reviewers, I think most comments or problems can be solved. After trying our best to answer all the comments, I would like to resubmit this revised manuscript. All the revised portions were highlighted by yellow background in this revised manuscript. Many thanks for your help. Looking forward to hearing from you.

Sincerely yours,

Yen-Wei Chu

Professor

Institute of Genomics and Bioinformatics

National Chung Hsing University

Taichung, Taiwan 40227 ROC

Tel: 886-4-22840338 ext. 7041

Fax:886-4-22859329

E-mail: ywchu@nchu.edu.tw

Answer to comments from Reviewer #1:

1. The introduction covers too many general contents without the focus on the specific topics in this review.

Response:

The introduction was revised to a more concise form, with more focus to gastrointestinal radiology. Some of unrelated general contents were removed (line 68-104).

2. The first and second paragraphs can be merged into a more concise presentation.

Response:

Contents of the second paragraph was condensed for simplicity, and merged with the first paragraph (line 68-91).

3. Notable statements are problematic even ungrounded, for example, I strongly disagree with the opinion the machine learning “will” replace, or “soon surpass” human experts.

Response:

We have modified it to a more appropriate term (line 80-91).

4. The authors mentioned, “the practice of interventional procedures in gastrointestinal radiology can be best exemplified by the treatment of liver cancer.” Liver cancer is only one example of gastrointestinal radiology. For a review, it is much needed to cover a broad range of representative studies instead of only one type of cancer.

Response:

The authors have broadened discussion of interventional procedures and lesion detection to cover other important disease in gastrointestinal field, such as in management of pancreatic tumor and intra-abdominal sarcoma(line 115-125), and vascular diseases (line 126-134).

5. Authors mentioned that “Due to more limited public database available, the development of AI in endoscopic radiology is less developed, so in this review article, we will focus on non-endoscopic radiological examination, particularly on CT and MRI.” Are there any reasons why AI endoscopic radiology is less developed? Insightful discussions are highly appreciated to enhance the quality of the discussion.

Response:

The authors explained technical issue of producing large-scale endoscopic procedure data, and the resulting difficulty in AI study(line 140-155), while also giving an insight

that these technical issue maybe solved in the next decade.

6. The section of "Introduction of AI" is not appropriated with many general contents. Given the focus of the work, please consider focusing heavily on the modern AI models, which is deep learning technology.

Response:

Contents of the second paragraph was condensed for simplicity, and merged with the first paragraph (line 68-91).

7. The discussion on the main challenges and pitfalls of AI in radiology is too general. Much of the contents have been repeatedly reported in the literature.

Response:

Thank you for the opinion. We have added some documentation and revised the narrative of the article (line 368-371; line 388-389)

8. For future works, please discuss more how different deep learning models can be better integrated into gastrointestinal radiology. Like how unsupervised, or automated ML models, can be used to use clinical data to improve the prediction or diagnostics performance. How can we utilize multi-center clinical data for generalized model evaluation? How can develop truly clinically-related applications in related areas?

Response:

Thank you for the insightful opinion. The authors made the following modifications according to this opinion:

1. Possible application of recent deep learning technologies, such as unsupervised and transfer learning in radiology are discussed(line 98-104; line 417-425).
2. Feasibility of direct clinical application is addressed, with in-vivo live visualization as an example(line 425-428).
3. Application of multi-center clinical data in model training and model evaluation is stated (line 429-437).