Answer to Reviewers

We appreciate the feedback about our article and the opportunity to greatly improve it. We hope that we could solve all the three suggestions accordingly. Next, we address each suggestion of each reviewer individually.

Reviewer #1:

Specific Comments to Authors:

The article described the progress of artificial intelligence for imaging diagnosis of hepatocellular carcinoma. Although there are some merits in this study, several issues should not be ignored.

We appreciate your input on our paper and we hope we can solve all of the suggestions accordingly.

1. This paper needs further proofreading, the text contains word error, such as "a deep learning system (DPS) based in convolutional neural networks (CNN)" should be change to "deep learning system (DLS)".

Corrected.

2. The author should add the comparison between the accuracy of artificial intelligence and biomarkers (or combining multiple biomarkers) in predicting the presence of hepatocellular carcinoma, e.g. AFP, DCP, AFP-L3. To date, combining multiple biomarkers to improve diagnostic accuracy is very important.

We have included a paragraph with the information about biomarkers and artificial intelligence.

3. Due to the diversity of liver tumor and complex imaging features, the application of artificial intelligence in the diagnosis of hepatocellular carcinoma is still challenging. In addition to HCC, primary malignant tumors in the liver include intrahepatic cholangiocarcinoma (ICC), mixed hepatocellular-cholangiocarcinoma (HCC-CC), and other rare tumors. In addition, there are many types of benign tumors in the liver, such as cysts, hemangiomas, focal nodular hyperplasia (FNH), adenomas, high-risk cirrhotic nodules. Can artificial intelligence diagnose and rule out these diseases? The author should add that.

We have included a paragraph with the information about liver tumors differentiation and artificial intelligence.

4. It is helpful to add a table for the comparison of different CLASSIFICATION OF THE ALGORITHM.

We have added a table comparing these algorithms.

Reviewer #2:

Specific Comments to Authors:

Authors had reviewed recent technical advances in diagnosis of HCC I would suggest following to make this manuscript more appealing They should discuss in each methods as:

1) technology

2) clinical applications

3) pros and cons

4) cost implications

This has been summarizes in Table 2 and 3.

Reviewer #3:

Specific Comments to Authors:

I red this manuscript and found that I am unfamiliar with this topic. So I suggest that the editor assign the new reriewer to this manuscript.

Reviewer #4:

Specific Comments to Authors:

The entitled paper is "Artificial intelligence for imaging diagnosis of hepatocellular carcinoma". The authors presented the ability of some AI (Artificial intelligence) approaches to early diagnosis of hepatocellular carcinoma. In this manuscript, there are lots of defects that should be carefully addressed:

　　　• The authors started with a very wide title (using AI) and this title didn't agree with the text of this manuscript. The text was talking about the applicability of the deep learning approach.

We have corrected this paragraph and rewritten several sentences in the text to reinforce that the paper is about Deep Learning Methods.

- There were few cases have been reported in this manuscript. The review paper should include more cases to provide good information and understanding to readers and researchers.

We added 3 more cases about liver nodule segmentation.

- It is very significant in applying AI models to prepare the data for these approaches. The common processes are; 1- data normalization or data standardization, 2- dimensionality reduction which is done using several approaches, 3- cleaning the data. I haven't seen the authors talk about these processes.

We have updated these paragraphs in order to describe more clearly the deep learning approach.

- The authors said that deep learning required few images to train and thus requiring less computational time. The authors are required to cite more evidence and sources.

We have adjusted the paragraph with three more references and explained a new method.

- In this manuscript, the deep learning system and CNN approach were extensively mentioned. It is significant to discuss other AI models such as support vector machine, random forest, and tree decision, and so on.

In fact, the focus of the paper is CNN, and the reviewed papers of our article are about CNN, so we updated those articles description to match the CNN approach that is the scope of our article. As result, we believe that we do not need to review other ML/DL approaches since the paper is only about CNN. We also updated the description of each reviewed paper to reinforce that the paper is about CNN.

- The statistical criterion used for assessing the prediction accuracy of AI models is also very significant. Herein, the authors mentioned only the accuracy which is not sufficient.

We have added the common metrics used to evaluate the accuracy of the methods: sensitivity and specificity.

- In the last pagraph of this manuscript, the the authors discussed the advantages and disadvantages of the Deep learning approach. However, few cases could not give you a clear decision of the superiority of the Deep learning approach over other approaches which you didn't discuss! The other observation that the authors mentioned that there is a defect in the deep

learning techniques. Therefore, they are required to explain what is the problematic issue regarding deep learning techniques.

We appreciate your input on our paper and we hope we can solve all suggestions accordingly. We have included a paragraph with the information about deep learning approach.

Answer to Editor:

We appreciate your input on our paper and we hope we can solve all of the three suggestions accordingly.

(1) PMID numbers are missing in the reference list. Please provide the PubMed numbers and DOI citation numbers to the reference list and list all authors of the references. Please revise throughout; and

We have added PubMed and DOI numbers in reference list.

(2) Please add table/figure to this review.

We have added three tables.

<mark>ROUND 2</mark>

Answer to Reviewers After reviewing the manuscript, I found that the authors have addressed the majority of issues and there are still two important issues that should be addressed before publishing this paper. We appreciate your input on our paper and we hope we can solve all of the suggestions accordingly. I. I can see the structure of the paper includes only, abstract, introduction, and conclusion. Therefore, there must be section discusses the evaluation of the previous researches and recommendations. Here, authors can take off some paragraphs from the introduction and add them to the new section.
We have followed the recommendation and we added two more sections.

II. The other crucial note related to the conclusion. I can currently see that the topic of the paper is about deep learning and I cannot see the authors are highlighting that. Please develop the conclusion and put the most important information that you gain.

We have completed the conclusion with appropriated information.