

Reviewer A

The primary goal of this research is to present the main inherent issues in CNN and what techniques can be used to solve the above problem in CNN. However, this article has no upper bound to get accepted:

Comment 1 . The title of this paper seems distracting the authors to understand the purpose of this article.

Reply 1:

i) *Edited the Title as follows:(p1 line1)*

Handling the predictive uncertainty of CNN in Medical Image Analysis: A Review

ii) *Edited (p1,line 16)*

“This review aims to investigate the main inherent uncertainty issue in CNN and what form of uncertainty quantification method can be applied with CNN to the task of medical image classification.”

iii) *Also, I edited several parts of the document to convince readers about uncertainty quantification in CNN to the task of medical image classification*

2. The authors should use scientific language while writing a paper. The paper is full of grammatical errors as well as the language of the paper does not read scientific. For example: "Image analysis systems play an essential part in the medical domain." "A large number of 27 medical images require a large extent interpretation by a medical expert".

Reply 2:

i) *Edited (p1,line 16)*

“This review aims to investigate the main inherent uncertainty issue in CNN and what form of uncertainty quantification method can be applied with CNN to the task of medical image classification.”

ii) *Again, I checked and removed grammatical errors in the whole document rewrote with missing scientific form.*

iii) *Edited (page 1 line 23)*

Certainty is an essential part of the medical image detection system in conjunction with accurate interpretation.

3. The authors have should have cited most recent and relevant publications as their reference.

Reply 3

i) *page 14, line 294*

For this analysis, 50 research articles from 2018 to 2023 were examined. I have mentioned it in Discussion Section in my original review article. (page 14, line 294)

4. As the title suggests the authors have reviewed medical images, they should have enlisted what modality images the references have utilized and what are the main loopholes of their proposed approach.

Reply 4

i) *Imaging techniques, also known as modality – including X-rays, ultrasound, CT scans and MRI are considered in this review article.*

ii) *Added missing modalities and loop holes and revised the paper again with Table 1 and Table 2.*

Reviewer B

The paper deals with a current topic that could potentially be of interest to readers, but it needs major revisions.

“The primary goal of this research” this is not a research paper, rather a survey on various methods for image segmentation. The work should be reformatted in such a way as to clearly indicate that it is a survey and not research with new results.

Reply1

i) *Edited (p1,line 16)*

“This review aims to investigate the main inherent uncertainty issue in CNN and what form of uncertainty quantification method can be applied with CNN to the task of medical image classification.”

„Several researchers have introduced different kinds of pre-trained deep convolutional neural network (DCNN) architectures, such as AlexNet [3], ResNet[4], VGG[5] and GoogleNet [6]” – All of these architectures are merely "backbones" for the actual networks doing the segmetnation, such as U-NET. https://link.springer.com/chapter/10.1007/978-3-319-24574-4_28. As you can see, this work currently has about 16k citations and is the basis for most modern segmentation algorithms based on deep neural networks. The author mentions the use of U-NET only in reference [5].

A very important aspect of training a deep neural network for segmenting is the use of appropriate image augmentation. With image augmentation, it is possible to train a U-net even when it uses only a few copies of the data in the training set. Please elaborate on this topic.

Reply 2

I have stated the following statement in my original review paper

“Several researchers have introduced different kinds of pre-trained deep convolutional neural networks (DCNNs) such as AlexNet [3], ResNet[4], VGG [5], and GoogleNet [6]. However, current DCNN models still do not completely handle ongoing segmentation and classification issues. The noise and illumination issues that are common to medical images also have an impact on these pre-trained CNN algorithms. Applying image pre-processing techniques can reduce noise, improve performance, and increase the predictability of CNN results [7]”

Reference [5]: Improved U-Net architecture with VGG-16 for brain tumor segmentation

Above reference [5] has shown that VGG, a convolution neural network (CNN) model supporting 16 layers, has handled segmentation with U-net Architecture and CNN with itself can't handle segmentation issues. My review paper aims to handle the uncertainty problem in medical image classification. Uncertainty occurs due to segmentation issues, additional noise and other reasons. But these paper [5] doesn't investigate the inherent uncertainty issues in CNN. But they didn't discuss how to remove noise removal. According to the literature review, segmentation alone is not enough to handle uncertainty.

My research I used image argument. But I didn't study U-net approach before that. But after reading U-net approach I understood it is very interesting part and will investigate that how U-net does overcome uncertainty in CNN.

I am not a native speaker however this paper seems to need language improvements, for example:

“Why fusion techniques needed in medical image analyzing?” -> “Why fusion techniques are needed in medical image analyzing? Etc.

Reply 3

Edited above subtopics (p10,line 232)

Why are fusion techniques needed in medical image analysis?

I checked the entire paper for grammar and scientific wording.