View Reviews

Paper ID
4948

Paper Title
Synthesis of Registered Multimodal Brain MRI with Lesions

Reviewer #1

Questions

1. [Summary] Please summarize the main claims/contributions of the paper in your own words.
This paper presents a method to synthesize brain MRI images with tumors and use these synthesized images to train tumor segmentation. The proposed method is evaluated on the BRATS2015 dataset. Relatively good segmentation performance is achieved by using multiple segmentors.

2. [Relevance] Is this paper relevant to an AI audience?
Relevant to researchers in subareas only

3. [Significance] Are the results significant?
Moderately significant

4. [Novelty] Are the problems or approaches novel?
Somewhat novel or somewhat incremental

5. [Soundness] Is the paper technically sound?
Has minor errors

6. [Evaluation] Are claims well-supported by theoretical analysis or experimental results?
Somewhat weak

7. [Clarity] Is the paper well-organized and clearly written?
Satisfactory

8. [Detailed Comments] Please elaborate on your assessments and provide constructive feedback.
This paper presents an interesting area of study, which uses synthetic data to train tumor segmentation. However, there are several main issues with this paper.
First, the method description is unclear. The overall structure looks logical but the actual description of each component is a bit high level. A large portion of the method section is used to list loss functions, yet there is no clear information about weighting and how to train the network effectively given the highly complex model. There is also no clear description about the details of the network architecture.
Second, results in Table 2 show that including synthetic data helps the segmentation performance. However, there is no performance comparison with other data synthesizing approaches. There are some existing studies in this area, so some comparison studies are expected.
Third, there is no performance comparison with other brain tumor segmentation methods on BRATS2015 dataset. In fact there are more recent datasets for brain tumor segmentation than BRAST2015 and this study should be performed on those datasets.
Fourth, ablation study is missing. With such a complex model design, ablation studies would be essential to validate the design choices.
Last, most of the figures are too small to see.

9. [QUESTIONS FOR THE AUTHORS] Please provide questions for authors to address during the author feedback period.
See detailed comments.

10. [OVERALL SCORE]
4 - Reject

15. Please acknowledge that you have read the author rebuttal. If your opinion has changed, please summarize the main reasons below.
No rebuttal is provided and I keep my rating as reject.

Reviewer #2

Questions

1. [Summary] Please summarize the main claims/contributions of the paper in your own words.
The paper addressed the problem of synthesis MRI by using conditional GAN. By training the structural feature map generator, the CGAN will take the structural features as input which is proved to be effective for good visualization results. Besides, the paper also proved the method could be used as a data augmentation method in training segmentation models.

2. [Relevance] Is this paper relevant to an AI audience?
Relevant to researchers in subareas only

3. [Significance] Are the results significant?
Significant

4. [Novelty] Are the problems or approaches novel?
Novel

5. [Soundness] Is the paper technically sound?
Technically sound

6. [Evaluation] Are claims well-supported by theoretical analysis or experimental results?
Sufficient

7. [Clarity] Is the paper well-organized and clearly written?
Good

8. [Detailed Comments] Please elaborate on your assessments and provide constructive feedback.
- The structural feature map generator is novel, and it is proved to be effective by experiments.
- The flow chart is clear, but the arrangement of the method part is a little bit hard to follow, as it includes too detailed steps and simple listings of loss functions.
- The experiments are solid.

9. [QUESTIONS FOR THE AUTHORS] Please provide questions for authors to address during the author feedback period.
- Please add a general training process to better describe the methods.
- To better prove the effectiveness of the structural feature map generator, could you please add one more experiment to show that the performance of the segmentation task by using images generated from the baseline CGAN?

10. [OVERALL SCORE]
5 - Marginally below threshold

15. Please acknowledge that you have read the author rebuttal. If your opinion has changed, please summarize the main reasons below.
I did not find the authors' rebuttal, so I intend to change my score from 6 to 5.

Reviewer #3

Questions

1. [Summary] Please summarize the main claims/contributions of the paper in your own words.
This paper considers the multimodal MRI synthesis approach. This is extremely important as the synthetic MRI can remarkably improve various steps in medical image processing. However, in my opinion, the contributions of

the paper are insignificant, and the overall manuscript preparation and experimental sections do not meet the requirement of a professional conference.

2. [Relevance] Is this paper relevant to an AI audience?
Not relevant

3. [Significance] Are the results significant?
Moderately significant

4. [Novelty] Are the problems or approaches novel?
Somewhat novel or somewhat incremental

5. [Soundness] Is the paper technically sound?
Has major errors

6. [Evaluation] Are claims well-supported by theoretical analysis or experimental results?
Not convincing

7. [Clarity] Is the paper well-organized and clearly written?
Poor

8. [Detailed Comments] Please elaborate on your assessments and provide constructive feedback.
The paper is poorly-written, and it seems that it seems more to be a draft than a final document submitted to the conference. Did the authors present a proper file? Many symbols are not defined, the images are too small, and the part of the equation seems so strange here. Overall, the paper does not meet the requirement of the professional conference as the AAAI.

9. [QUESTIONS FOR THE AUTHORS] Please provide questions for authors to address during the author feedback period.
Why did you send such a draft of the paper to the conference? I do not doubt the idea presented in the article, but the presentation does not meet the requirement of the AAAI conference...

10. [OVERALL SCORE]
3 - Clear reject

15. Please acknowledge that you have read the author rebuttal. If your opinion has changed, please summarize the main reasons below.
After reading all the review I keep my position to reject the paper.