Proposal Feedback

Well-written and structured proposal. Here are some comments:

1. The methods mention a shared encoder for both segmentation and classification tasks, but it's not clear how the decoder branches are designed. Are there separate decoders for segmentation and classification, or are features reused between tasks? How is the loss function designed to balance both tasks—are you using a weighted sum of losses (e.g., Dice loss + Cross-Entropy loss)? Please provide a detailed diagram or description of the architecture to explain how multi-task learning is implemented.

2. Given the limited dataset size (222 volumes), overfitting is a major concern. What specific regularization techniques will you implement?

3. Data augmentation is critical here, especially with small datasets and high variability in CT scans. Specify what types of augmentations you will apply to artificially expand the dataset and introduce variation,

4.  Will you use k-fold cross-validation or other robust evaluation protocols to ensure that the model generalizes well across subjects? Please specify your train/validation/test split strategy.

5. Since rapid diagnosis is a clinical priority, will you assess the model’s inference time? Multi-task learning may improve efficiency by sharing computations—quantifying this benefit would add value.

6. It would be valuable to compare your multitask model’s segmentation and classification performance against a strong baseline, such as a standard U-Net for segmentation and a separate classifier for classification. This will allow you to demonstrate that your model not only performs both tasks simultaneously but also maintains or improves performance on each individual task (segmentation and classification) without sacrificing accuracy. Highlighting this will further emphasize the efficiency of your multitask model while proving it does not compromise performance compared to single-task models.