My main requests are for you to clarify what exists vs. what you will create for the capstone.

Hello Ted,

Thanks for your feedback! I would like to address your main question first about existing and innovative parts of this pipeline. We have code for each preprocessing step and U-Net model since these have been used for previous individual segmentation tasks in our lab. However, it has never been compiled as a pipeline for multiple tasks to develop generalizability of biomedical image segmentation tasks. We primarily believe that no preprocessing steps need to be configured to fit different datasets because most of those rules are just the same for different tasks (e.g., resampling voxel spacing, cropping regions of interest (i.e., non-zero regions)). One exception is that MRI and CT have slightly different preprocessing steps, but no parameter needs to be adapted for different tasks. What I plan to do is to tune the U-Net model to get a good performance, evaluated by a few metrics mentioned in the proposal. My innovative part is to develop model tuning methods for model hyperparameter selection depending on which input data is received. After this step, if U-Net tuning isn’t affecting the segmentation performance too much, we are then going to consider modifying parameters in preprocessing steps and apply rules from nnU-Net paper to the selection of these parameters. Moreover, our data is publicly available, so IRB approval is not required. I will talk about our data details in my progress report since this is part of the plan for this month. I will also mention additional preprocessing parameter selection in the report (i.e., adjustment of goals).