Large-scale Data Collection and Evaluation Protocols for Interactive Segmentation
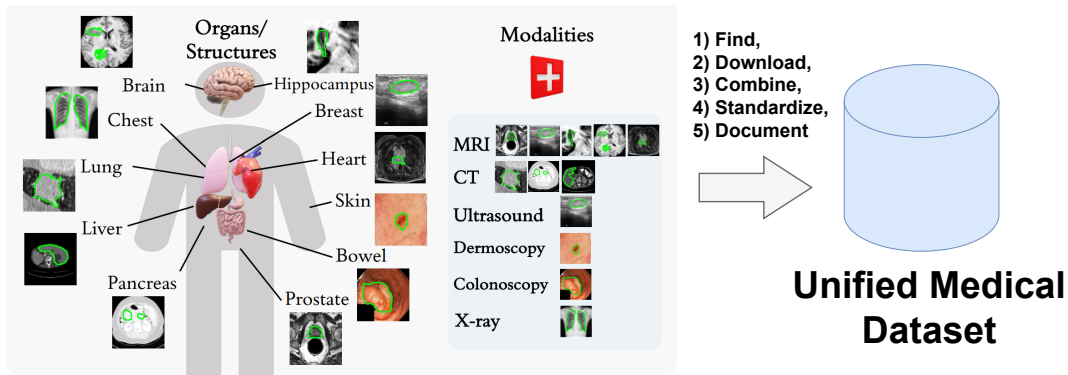

Figure 1: Image Source (left) [1]

Interactive segmentation models streamline the data annotation process for medical tasks, ultimately saving time for clinicians. However, a notable challenge is the absence of a standardized benchmark dataset for training and evaluating interactive methods. Our primary objective is to curate comprehensive datasets from public segmentation challenges encompassing diverse imaging modalities and segmentation targets within the medical domain into one large super-set. Additionally, our secondary goal involves establishing a rigorous evaluation protocol tailored to each sub-dataset's unique characteristics, such as targets, target sizes, and overall dataset size. The final goal is to pre-train a model on the large super-set and establish a baseline model for each of the sub-datasets so that future interactive models have a model to compare to.

The goals can be summarized as follows:

1. Find relevant datasets for each modality (CT, MRI, PET/CT, Dermoscopy, Fundus, etc.), download them into a dataset archive, and describe their characteristics given pre-defined meta-attributes

2. Convert each dataset into a consistent file structure for training/validation

3. Define a meaningful evaluation protocol for each downloaded dataset based on its meta-attributes

4. Pre-train an interactive baseline model on all gathered datasets and report the result for various modalities and target structures

The estimated time for this project is **6 months**

The estimated start date is **Spring 2024**

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References

[1] S. He, R. Bao, J. Li, P. E. Grant, and Y. Ou, "Accuracy of segment-anything model (sam) in medical image segmentation tasks," *arXiv preprint arXiv:2304.09324*, 2023.