Visualizing Medical Image Segmentation Results Using Multiple Prompt

Project Management and Software Development
for Medical Applications

General Info

Contact Person: Hong Joo, Lee

Contact Email: hongjoo.lee@tum.de

Project Abstract

Segmenting target objects in medical images is vital for precise volume/area calculations, ensuring reliable diagnosis and effective treatment evaluation for diseases like Duchenne muscular dystrophy, hyperthyroidism, or nerve-blocking pain. Therefore, efficient visualization can shorten the diagnostic process and help make a more accurate diagnosis. In this project, the student is to develop segmentation results by using various types of prompts such as text, mask, point, etc. We expect that this project can help the radiologist reduce the diagnostic process time.

Background and Motivation

Recently, many algorithms that visualize segmentation results with multiple have been proposed. Using various types of prompts can provide user-friendly and more accurate segmentation results. Especially, since radiologists use different types of prompts (points, masks, etc) to find the region of interest such as organs or lesions, it is important to the success of this project.

Student's Tasks Description

In the first step, the student implements the code presented in the Segment Anything paper [1].

Next, the student makes a UI that can receive input in the form of various types of prompts presented in the paper such as text, mask, point, etc.

Finally, the student trained a segmentation model on the medical data and apply it to the UI. In this process, the student needs to train or fine-tune a segmentation model that uses more than one prompt. The student can refer to the paper [2].

Technical Prerequisites

Program Language: Python

Library: Pytorch

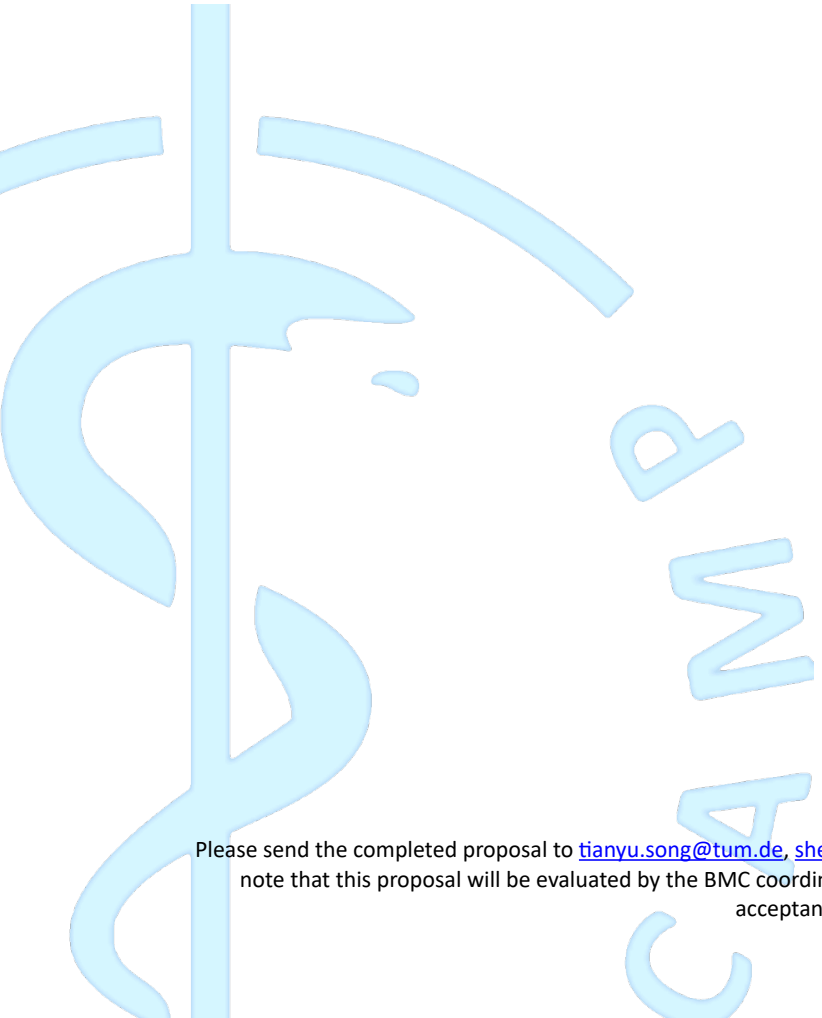
Optional Experience: Git, Experience in training DNN is preferred

References

[1] Kirillov, Alexander, et al. "Segment anything." Proceedings of the IEEE/CVF International Conference on Computer Vision. 2023.

[2] Liu, Jie, et al. "Clip-driven universal model for organ segmentation and tumor detection." Proceedings of the IEEE/CVF International Conference on Computer Vision. 2023.

Please send the completed proposal to tianyu.song@tum.de, shervin.dehghani@tum.de and felix.tristram@tum.de. Please note that this proposal will be evaluated by the BMC coordinators and will be assigned to a student only in case of acceptance.



Please send the completed proposal to tianyu.song@tum.de, shervin.dehghani@tum.de and felix.tristram@tum.de. Please note that this proposal will be evaluated by the BMC coordinators and will be assigned to a student only in case of acceptance.