HAAG Weekly Report Week 1 & 2

Ming Zhong

Lizard Jaw Segmentation

Jan 17, 2025

Time-Log

- Very brief sections of bullet points for the following:
    - What did you do this week?
        - Hosted a meeting with my internal project team (Ming, Philip, and Shuyu) on Wednesday at 3 PM (GMT-7).
        - Obtained access to past work done by Philip, including his GitHub repo and project documentation.
        - Reviewed the project documentation and the GitHub repository shared by Philip.
        - Signed up for meeting manager position
        - Signed up for CS8903 course
        - Developed initial research plan
    - What are you going to do next week
        - Resubmit research plan based on feedback from Bree
        - Meet with the computational advisor.
        - Record meeting and transcript, upload relevant records to sharepoint
        - Prompt the team to prepare a slide deck summarizing his work for the computational advisor.
        - Obtain access to the 3D lizard data used by Philip
        - Read through Philip's curated list of relevant research papers
    - Blockers, things you want to flag, problems, etc.
        - N/A

Abstracts:

Abstract

Interactive medical image segmentation (IMIS) has shown significant potential in enhancing segmentation accuracy by integrating iterative feedback from medical professionals. However, the limited availability of enough 3D medical data restricts the generalization and robustness of most IMIS methods. The Segment Anything Model (SAM), though effective for 2D images, requires expensive semi-auto slice-by-slice annotations

for 3D medical images. In this paper, we explore the zero-shot capabilities of SAM 2, the next-generation Meta SAM model trained on videos, for 3D medical image segmentation. By treating sequential 2D slices of 3D images as video frames, SAM 2 can fully automatically propagate annotations from a single frame to the entire 3D volume. We propose a practical pipeline for using SAM 2 in 3D medical image segmentation and present key findings highlighting its efficiency and potential for further optimization. Concretely, numerical experiments on the BraTS2020 and the medical segmentation decathlon datasets demonstrate that SAM 2 still has a gap with supervised methods but can narrow the gap in specific settings and organ types, significantly reducing the annotation burden on medical professionals. Our code will be open-sourced and available at https://github.com/Chuyun-Shen/SAM_2_Medical_3D.

Link

[2408.02635v1] Interactive 3D Medical Image Segmentation with SAM 2

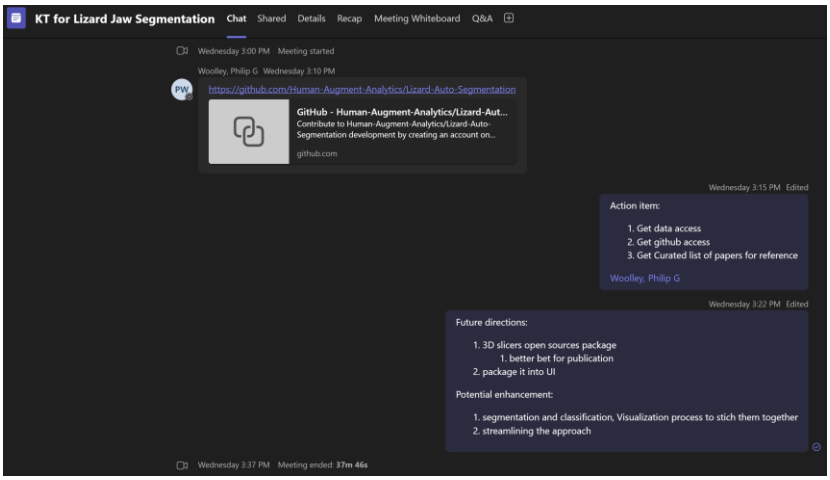
Summary

This paper discusses a new method for automatically segmenting 3D medical images using the Segment Anything Model 2 (SAM 2), which can leverage 2D image slices like video frames. The approach aims to reduce the need for extensive manual annotations by medical professionals, showing promise in improving efficiency while still needing some refinement compared to traditional supervised methods.

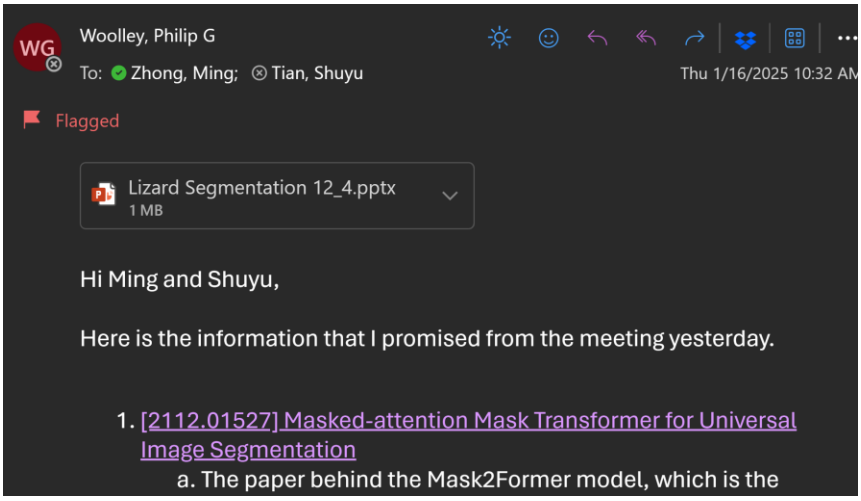
What did you do and prove it

During the first two weeks, I focused on project onboarding. I familiarized myself with the project and the HAAG requirements. Additionally, I aimed to gain access to all relevant resources to enable me to quickly contribute to the project.

Proof of meeting



Proof of getting access to all relevant resources



Woolley, Philip G
To: Zhong, Ming; Tian, Shuyu
Thu 1/16/2025 10:32 AM

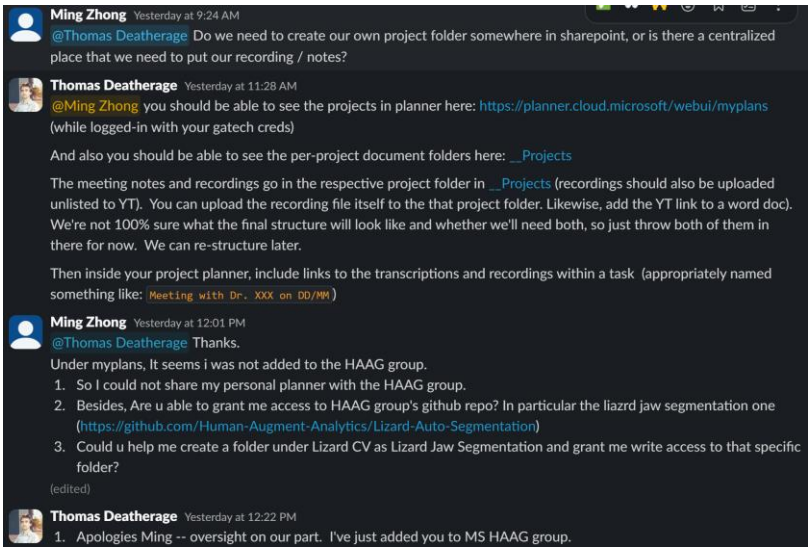
Flagged

Lizard Segmentation 12_4.pptx
1 MB

Hi Ming and Shuyu,

Here is the information that I promised from the meeting yesterday.

1. [2112.01527] Masked-attention Mask Transformer for Universal Image Segmentation
    a. The paper behind the Mask2Former model, which is the



Ming Zhong Yesterday at 9:24 AM
@Thomas Deatherage Do we need to create our own project folder somewhere in sharepoint, or is there a centralized place that we need to put our recording / notes?

Thomas Deatherage Yesterday at 11:28 AM
@Ming Zhong you should be able to see the projects in planner here: https://planner.cloud.microsoft/webui/myplans (while logged-in with your gatech creds)

And also you should be able to see the per-project document folders here: __Projects

The meeting notes and recordings go in the respective project folder in __Projects (recordings should also be uploaded unlisted to YT). You can upload the recording file itself to the that project folder. Likewise, add the YT link to a word doc). We're not 100% sure what the final structure will look like and whether we'll need both, so just throw both of them in there for now. We can re-structure later.

Then inside your project planner, include links to the transcriptions and recordings within a task (appropriately named something like: `Meeting with Dr. XXX on DD/MM`)

Ming Zhong Yesterday at 12:01 PM
@Thomas Deatherage Thanks.
Under myplans, It seems i was not added to the HAAG group.
1. So I could not share my personal planner with the HAAG group.
2. Besides, Are u able to grant me access to HAAG group's github repo? In particular the liazrd jaw segmentation one (https://github.com/Human-Augment-Analytics/Lizard-Auto-Segmentation)
3. Could u help me create a folder under Lizard CV as Lizard Jaw Segmentation and grant me write access to that specific folder?

(edited)

Thomas Deatherage Yesterday at 12:22 PM
1. Apologies Ming -- oversight on our part. I've just added you to MS HAAG group.