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Week 5

Applications of Foundation Models and Efficient Diffusion Models to Dental Radiography to Assist Dental Treatment Planning

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Project Overview

- Teeth charting is a manual process at the office
- It is a two person job and is error prone
- We aim to use AI to automate teeth charting
- Since dental datasets are limited, we are using foundation models
- To assist in pre-surgical planning and patient education we aim to apply diffusion models to generate synthetic teeth for fitting

Proposed Experiments for the FM Portion

1. LoRA
2. Yolo + small fine tuning
3. Yolo + LoRA

What Has Been Finished

Zero-shot with MedSAM



What Has Been Finished

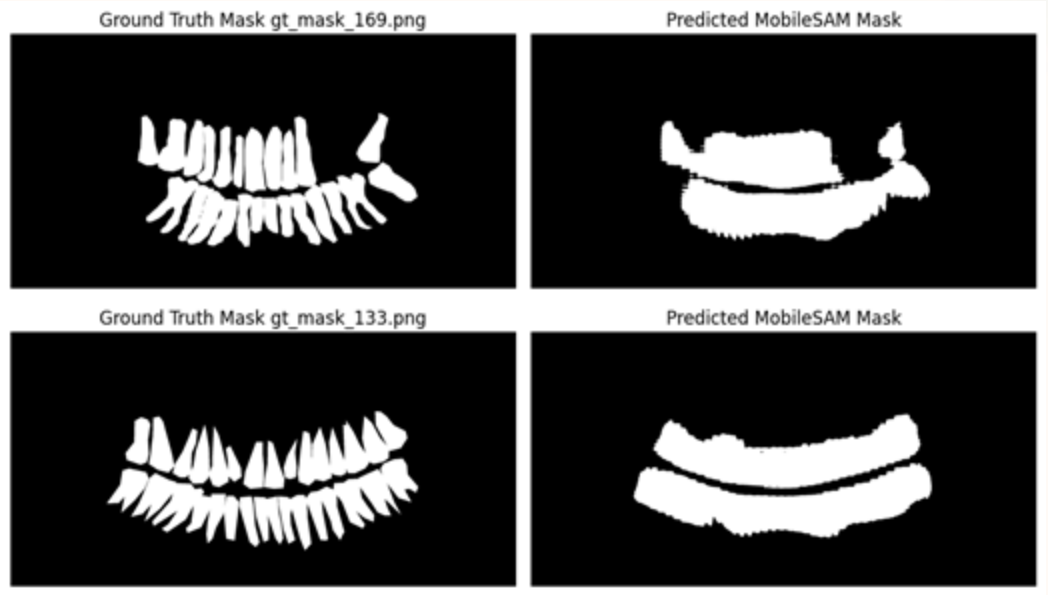
Basic fine tuning with MobileSAM

Zero-shot MobileSAM Mask

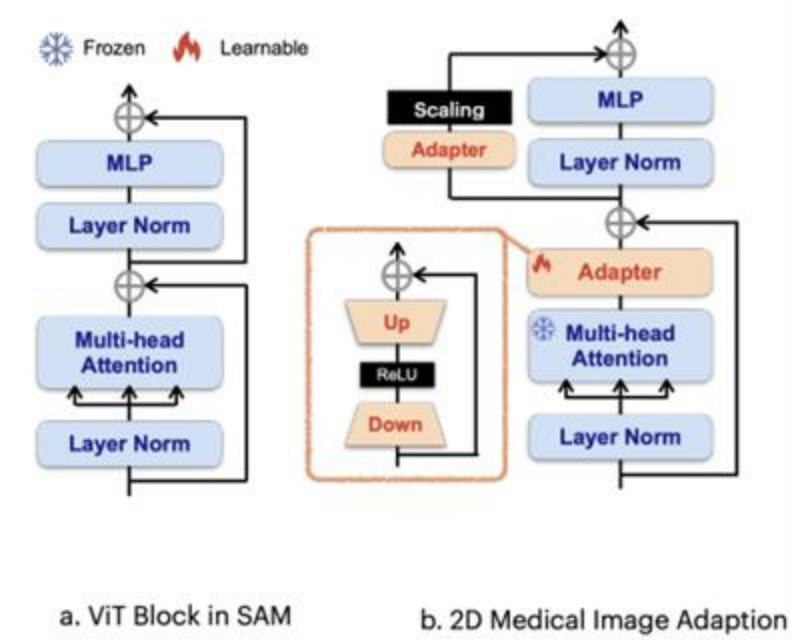


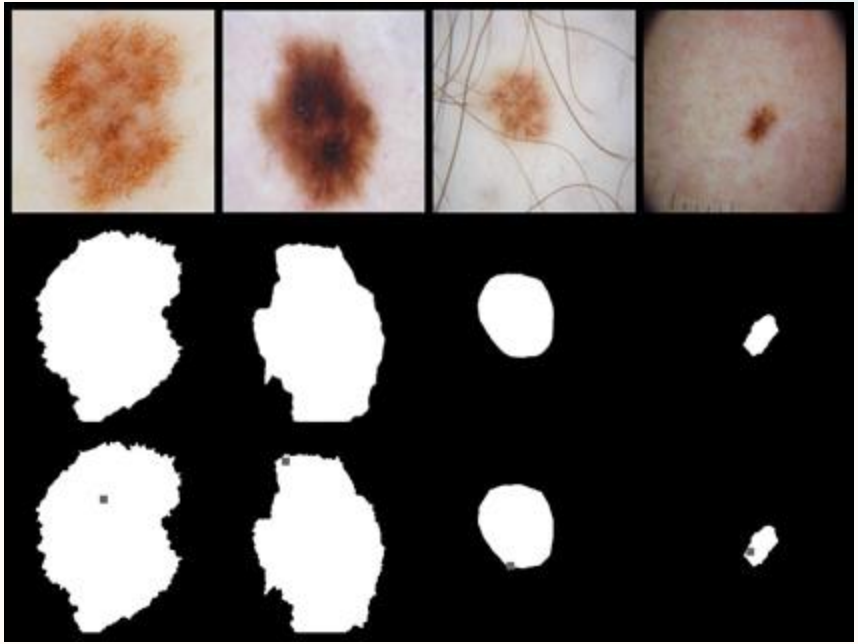
Zero-shot MobileSAM Mask



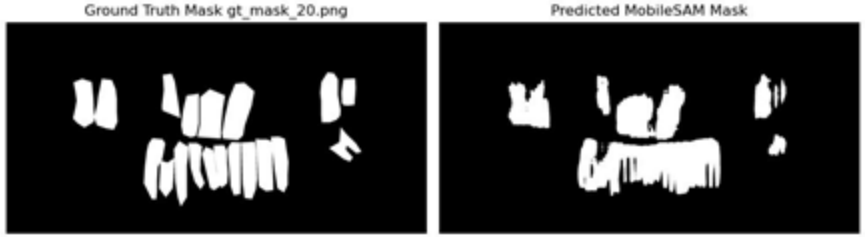


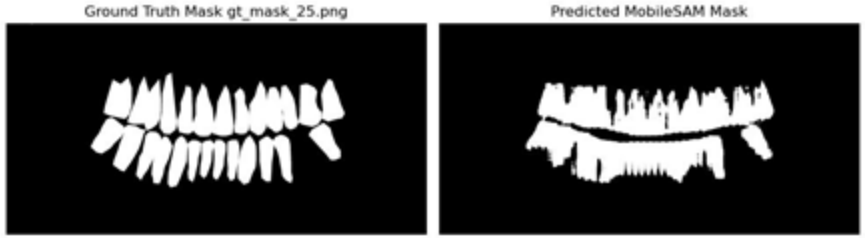
What Was Done This Week

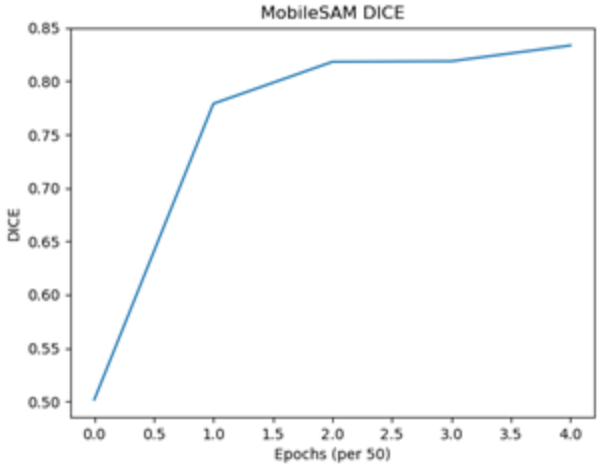


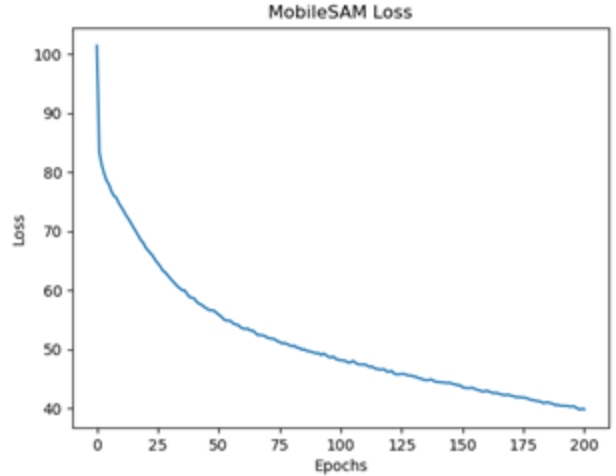


What Was Done This Week









Proposed Experiments for the FM Portion

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3. Yolo + LoRA

Next Week

- Finish up inputting the teeth dataset into the MedSAM Adapter
- Research and implement YOLO using online examples
- Adapt YOLO to the teeth dataset using the given ground truth data

References

SuperMedIntel. (n.d.). *GitHub - SuperMedIntel/Medical-SAM-Adapter: Adapting Segment Anything Model for Medical Image Segmentation*. GitHub. https://github.com/SuperMedIntel/Medical-SAM-Adapter/tree/main

https://zaradental.com/teeth-numbers-and-names/

https://www.kaggle.com/datasets/humansintheloop/teeth-segmentation-on-dental-x-ray-images/data

https://github.com/bowang-lab/MedSAM

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Thanks!