Vessel Tissue Detection During Third Space Endoscopy

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Paper ID BM5020

Abstract

In this project we aim to implement semantic segmentation model to help with segmentation task during Endoscopic surgery. A DeepLabV3 model with Resnet-101 as backbone and FCN head as auxillary classifier is trained. We have extracted images from POEM videos and annoted using Segment_anything model.

1. Introduction

Endoscopy is non-surgical examination of internal organs using a flexible tube with a light and camera called an Endoscope. It is an established resection technique to diagnose, treat, or monitor conditions in the digestive or respiratory tract. There are two major endoscopic procedures, **Endoscopic submucosal dissection (ESD)** and **Peroral Endoscopic Myotomy (POEM)**.

1.1. Problem Statement

ESD and POEM are complex procedures with elevated risk of operator dependent adverse events. There are high chances of intraprocedural bleeding and perforation which lead to significant risks to patient safety and procedural success. In this project we aim to develop an Artificial Intelligence Clinical Decision Support Solution (AI-CDSS) for on-time detection of Muscle layer, Submucosal layer and Electrode; making it helpful and assisting for operator during surgery.

References