Deep Learning-Based Cine MRI Segmentation for Cardiac Function Assessment

Advisor: Daniel Stuckey, Prof., UCL, Jan. 2025- Present

• Manual segmentation of ED and ES area for assessing ventricular volumes from short-axis cardiac MR images.

• Implemented multiclass left ventricle segmentation using short-axis cardiac MRI registry with UNet3+.

Laparoscopic Surgical Instruments Binary Segmentation

Advisor: Wenpeng Gao, Assoc. Prof., HIT, Sep. 2023- Jan. 2024

• Designed nove architecture based on U-Net with Transformer, tested on Endovis2017 dataset for surgical instruments binary segmentation, implemented ablation experiments to verify the efficiency of components.

• Segmented the sequenced images extracted from the video, approximately achieved surgical instrument tracking and outperformed existing schemes.- Code Available

Phase Detection of Surgical Instruments

Advisor: Wenpeng Gao, Assoc. Prof., HIT, Jun.- Jul. 2022

• Extracted images from Cholec80 videos and modified labels, generated random data to test feasibility, fine-tuned and trained AlexNet with acquired images.

PeRCeiVe Lab, University of Catania (Remote)

Advisor: Concetto Spampinato, Prof., Jan. 2025- Present

• Fine-tuned existing networks and compared performances on Kvasir and NCI-ISBI 2013 Dataset for saliency prediction.

• Generated saliency maps with the best performing network as prompts for segmentation with SAM 2 .

• Work will be submitted to MICCAI.