

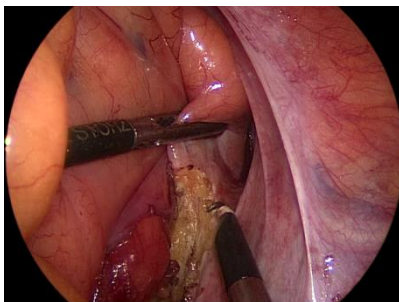


Sub-Challenge Instrument Segmentation and Tracking

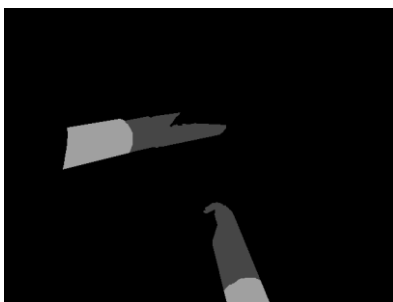
Readme Segmentation Rigid Instruments

Training Data (160 2D images + annotations in total)

- 40 2D in-vivo images from 4 laparoscopic colorectal surgeries together with annotated masks.
We provide two types of masks:
 - Mask 1: Each pixel in the mask (R,G,B) is labelled as either background (0,0,0), shaft (160,160,160) or manipulator (70,70,70)
 - Mask 2: Each pixel in the mask (R,G,B) is labelled as either background (0,0,0), instrument1 (20,20,20), instrument2 (40,40,40) or instrument3 (60,60,60) depending on the amount of instruments in the image
- Training Data Example:



img_xx_raw.png



img_xx_class.png (Mask1)



img_xx_instrument.png (Mask 2)

Test Data (140 2D images)

- 10 additional 2D images for each of the 4 recorded laparoscopic surgeries provided for training
- 2 additional recorded surgeries with 50 2D images

No mask will be provided for testing for the duration of the challenge.

Release of the test data: 14.9.

Submission

Please upload your results and the short method description in a separate zip archive named *Segmentation_<Username>_Rigid_Results.zip*

Format: Please provide either result segmentations for the whole instrument or results segmentations for instrument parts separated into shaft/manipulator if your method is able to distinguish both as described below or both:

- 3 channel png mask (R,G,B) with annotated instrument (80,80,80) and background (0,0,0)

Naming convention: *<OriginalSurgery>/<OriginalName>_ResInstr.png*

- 3 channel png mask (R,G,B) with annotated shaft (160,160,160), manipulator (70,70,70) and background (0,0,0)

Naming convention: *<OriginalSurgery>/<OriginalName>_ResClass.png*

The pixel coordinate system starts at the upper left corner (0,0).

Note: Please use the training data in a leave-one-surgery-out fashion: Please do not include the same surgery in the training set when testing the 10 additional 2D images for each of the 4 laparoscopic surgeries provided for training. For the new surgeries the whole training data can be used.

Deadline: 21.9.

Reference

For evaluating the instrument segmentation, the DICE coefficient between the reference and the submitted result is used. Furthermore, typical classification metrics like precision and recall are calculated.

Award

The DICE coefficient between the reference and the submitted result of the **whole instrument** (Mask2) is taken into account. To be considered for the *Instrument Segmentation Award* participation in the instrument segmentation for robotic instruments is necessary.