INTUITIVE

Needle Drop Detection

Problem statement

Design a deep learning model to classify whether the needle in each video frame is

1) grabbed by either left or right surgical tool or
2) dropped

Download data

1. Box Link: https://intusurg.box.com/s/0431ijlgaefmfro32ja07mbioeklyko5
2. Password: Intuitive

Data for training and testing

- Training dataset:
  - Release_v1/videos/fps1
    - Video clips downsampled to 1 fps
  - Release_v1/annotations/ bounding_box_gt
    - These are annotations of surgical tools and needle with grabbed or dropped labels.
    - Grabbed or dropped labels can be found in the “orientation” column for needles.
  - Note: skill_metric_gt.csv has the needle drop counts for each case video.
- Testing data:
  - Release_Test/videos/fps1/caseid_000070_fps1.mp4
  - Release_Test/videos/fps1/caseid_000184_fps1.mp4

Submission

1. Please share your code repository through GitHub/GitLab/Bitbucket.
2. Please share your training code, inference code and trained model weights. Inference code should take one video clip as input and generate needle drop/grabbed labels for each video frame.
3. Please provide a readme and requirement.txt file in your repository.
4. Docker is optional.

Notes

1. Please make sure your code is **executable** and **primarily focus on the completeness of the training and inference code pipeline**.
2. This problem utilizes the dataset from our 2021 MICCAI challenge but it is different from the MICCAI problem. More information can be found here: https://www.synapse.org/#!Synapse:syn25127311/wiki/608840.
3. Using bounding box annotations is optional. If you would like to use bounding box annotations, an example data converter script to MS COCO format is provided in the MICCAI evaluation code convert2COCO.py.
4. You will only need to use the first released training dataset to train your model. If you have limited compute resources, please just use a subset of training data of your choice and list it in the readme.
5. Please reach out to xi.liu@intusurg.com if you have any questions.