Alpha Tracker

Installation

* before installation, make sure you are in the root of AlphaTracker

step 1. create conda enviroment with dependencies:

```
conda env create -f environment.yml
```

If the above command line failed, please install the package manually with pip and then run the following command line:

```
conda activate alphatracker
conda env update --file environment.yml
```

step 2. Install YOLO for training.

```
cd ./train_yolo/darknet/
make
cd ../../
```

Training

Step 1. data preparation

labeled data is required to train the model. The code would read RGB images and json files of annotations to train the model.

Figure 1 shows an example of annotation json file. In this example, there only two images. Each image has two mice and each mouse has two keypoint annotated.

Step 2. configure

Before trianing, you need to charge the parameter in ./setting.py (read block in figure 2). The meaning of the parameter can be found in the ./setting.py.

Step 3. run code

Use the following command line to train the model:

```
conda activate alphatracker
python train.py
```

Tracking

Step 1. configure

Before tracking, you need to charge the parameter in ./setting.py (blue block in figure 2). The meaning of the parameter can be found in the ./setting.py.

Step 2. run code

Use the following command line to train the model:

```
conda activate alphatracker
python track.py
```

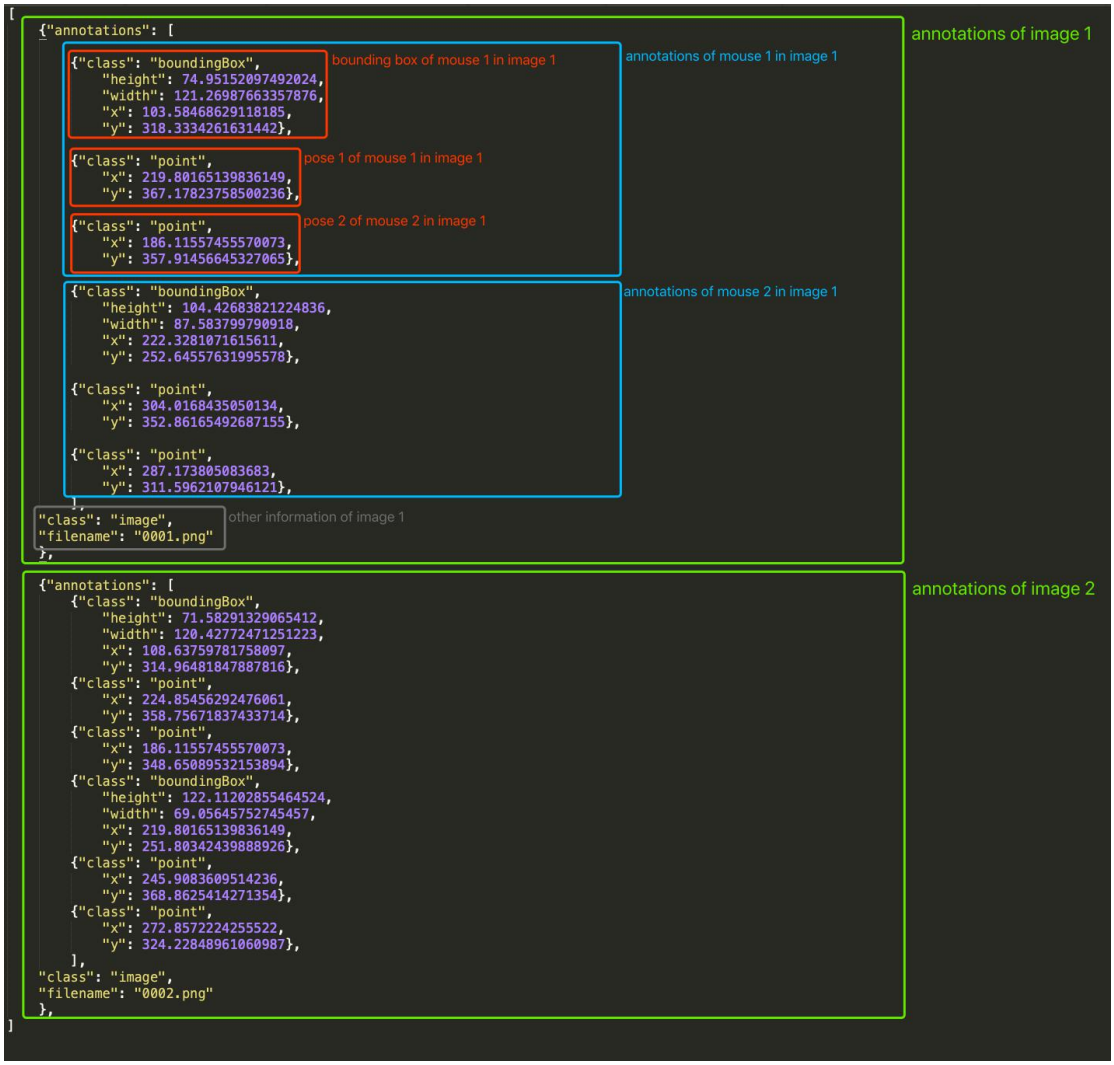

Figure 1. format of the json file

```
######################################################################
###                        general setting                         ###
######################################################################
# gpu_id is the id of gpu that will be used
gpu_id = 6


######################################################################
###                         code path setting                      ###
######################################################################
AlphaTracker_root = '/home/zexin/project/mice/AlphaTracker/'


######################################################################
###                        data related setting                    ###
######################################################################
# image_root_list is a list of image folder paths to the RGB image for training
image_root_list=[\
                 '/disk4/zexin/datasets/mice/new_labeled_byCompany/0416/02/color/', # image folder path 1
                 '/disk4/zexin/datasets/mice/new_labeled_byCompany/04/data_04/', # image folder path 2
                 '/disk4/zexin/datasets/mice/new_labeled_byCompany/05/data_05/', # image folder path 3
                ]
# json_file_list is a list of paths to the json file that contain labels of the images for training
json_file_list = [\
                  '/disk4/zexin/datasets/mice/new_labeled_byCompany/0416/02/annotation_02.json', # label json file 1
                  '/disk4/zexin/datasets/mice/new_labeled_byCompany/04/multi_person_04.json', # label json file 2
                  '/disk4/zexin/datasets/mice/new_labeled_byCompany/05/multi_person_05.json', # label json file 1
                 ]
# num_mouse is a list the specify the number of mouse in the images in each image folder path
num_mouse = [4,4,4]
# exp_name is the name of the experiment
exp_name = 'labeled_byCompany_020405_split90_ori'
# num_pose is the number of the pose that is labeled
num_pose = 4
# train_val_split is ratio of data that used to train model
train_val_split = 0.90
# image_suffix is the suffix of the image
image_suffix = 'png'


######################################################################
###               training hyperparameter setting                  ###
######################################################################
sppe_lr=1e-4
sppe_epoch=10
yolo_lr=0.0005
yolo_iter=20000

######################################################################
###                    demo video setting                          ###
######################################################################
# video_full_path is the path to the video that will be tracked
video_full_path = '/disk4/zexin/project/mice/datasets/0603/1959_black_two.mov'
# start_frame is the id of the start frame of the video
start_frame = 0
# end_frame is the id of the last frame of the video
end_frame = 60
# max_pid_id_setting is the number of mice in the video
max_pid_id_setting = 2
# result_folder is the path to the folder used to save the result
result_folder = '/home/zexin/project/mice/AlphaTracker/examples/tracke_result_folder/'
# remove_oriFrame is whether remove the original frame that generated from video
remove_oriFrame = True
# weights and match are parameter of tracking algorithm, following setting should work fine, no need to change
weights = '0 6 0 0 0 0 '
match = 0
```

Figure 2. parameter in ./setting.py