Attachment to Fiche logiciel TER34

Etudiants
ZABRODIN Ivan EIT
RUBINSTEIN Alex
MAM5-SD
CULLERON Marie
MAM5-SD

Professeurs
PRECIOSO Frédéric
LINGRAND Diane

1. Labeling

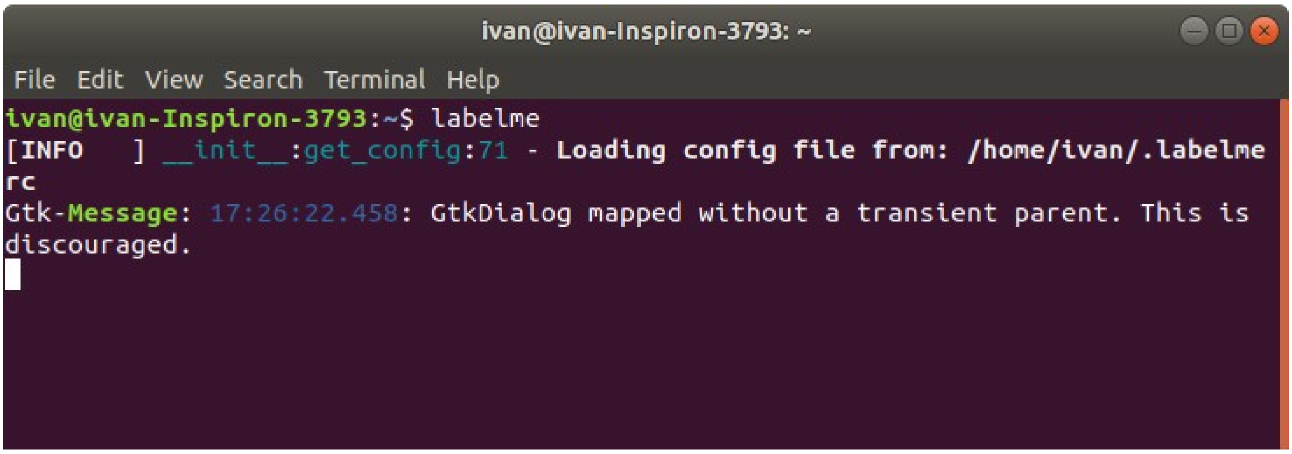
To prepare the annotated data for training we need to label it using labelme utility from https://github.com/wkentaro/labelme

The easiest way to install it and use is by using Anaconda (https://www.anaconda.com/products/individual)

```
# python2
conda create --name=labelme python=2.7
source activate labelme
conda install pyqt
pip install labelme

# python3
conda create --name=labelme python=3.6
source activate labelme
pip install labelme
```

After an installation, the labelme interface can be started by typing *labelme* with appropriate anaconda environment activated



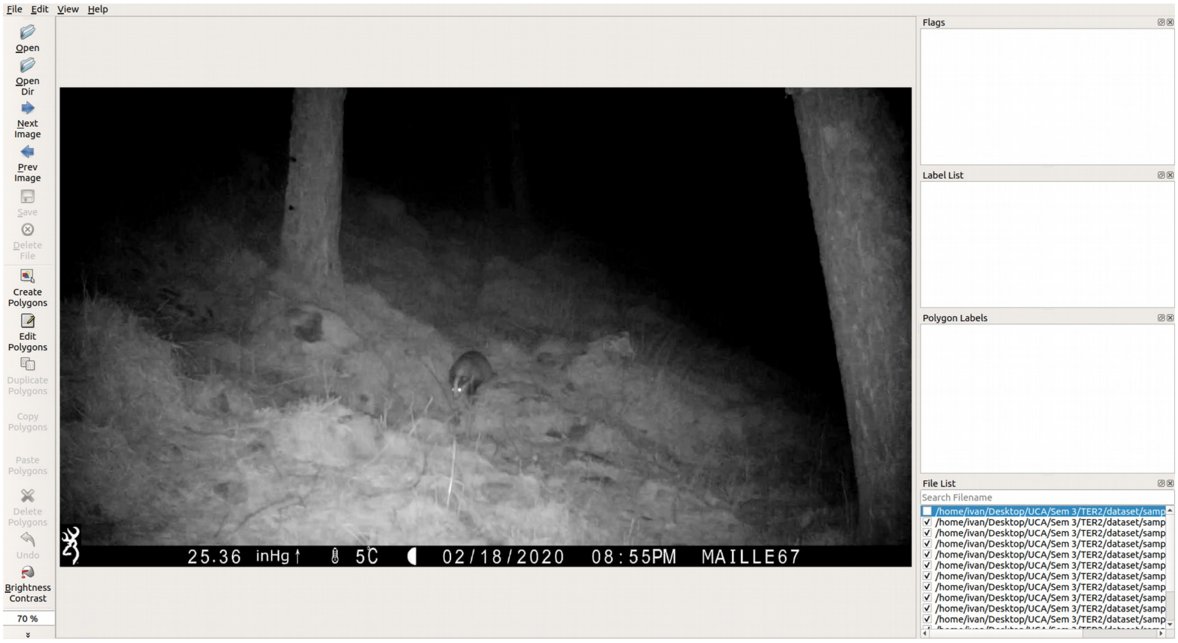
ivan@ivan-Inspiron-3793: ~
File Edit View Search Terminal Help

```
ivan@ivan-Inspiron-3793:~$ labelme
[INFO   ] __init__:get_config:71 - Loading config file from: /home/ivan/.labelme
rc
Gtk-Message: 17:26:22.458: GtkDialog mapped without a transient parent. This is
discouraged.
```

Labelme GUI activated from terminal

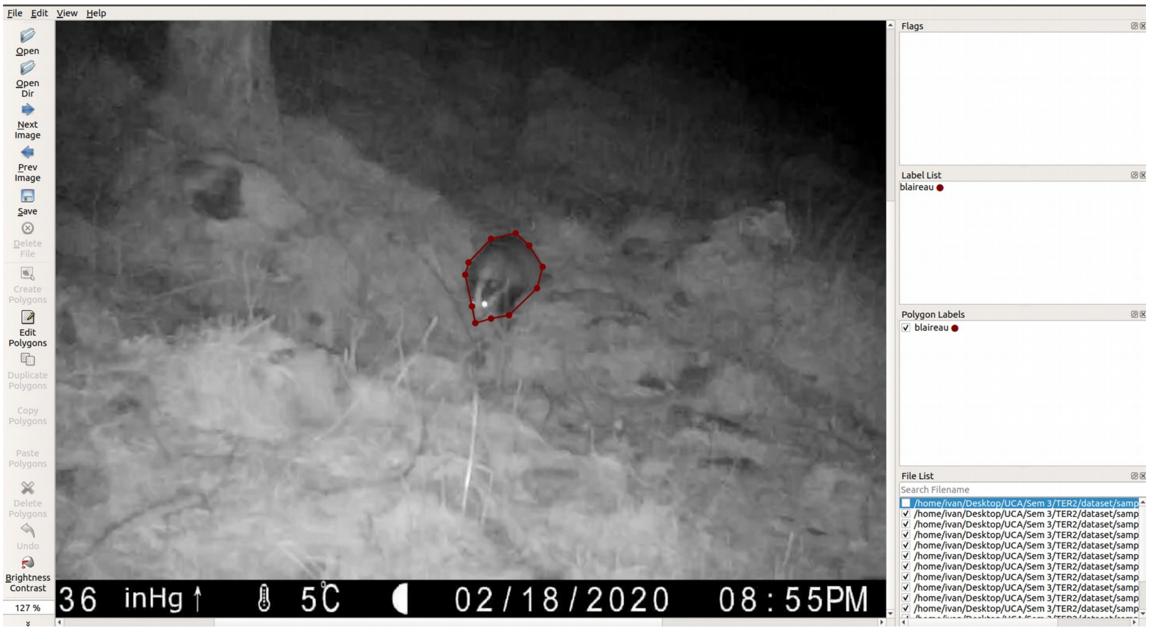
Labelme GUI is presented on the screenshot below.

With *Open Dir* button you can open the folder with non-annotated data. All the samples can be in one folder, but for simplicity prepare the data in the way such that each image has an appropriate name that corresponds to an object (objects) that are presented on it.



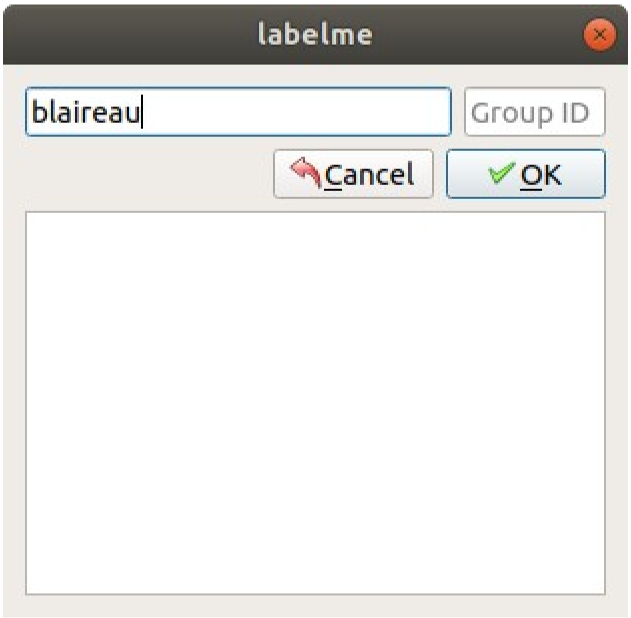
Labelme GUI

With *Create Polygons* button you can create a polygon around an object by using your mouse



Labelme GUI with annotated image

After finishing the polygon the menu from the screenshot bellow will appear to prompt you set up the name of an object. During next annotations you will be able to chose the label from the list that you have created.



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Menu for creating labels for species

After the annotation process is done you should normally have the folder with images and JSON files, where each json file corresponds to the concrete image. To perform the training we need to combine all those files in one JSON of COCO format. In order to do this we need to download the script called labelme2coco from https://github.com/haroonshakeel/labelme2coco
Put this script in the folder where is your images folder is located and type the command:

```
python labelme2coco.py {images_folder}
```

With this you will get one JSON file with all the annotations. If you have train and test data, better to split them into two different folders before and then run this script for both folders to have separated annotations files for training and testing.

2. Detectron2 installation

To perform the training and testing we need to install all the requirements of Detectron2

Again, the easiest way to achieve it is to use Anaconda. The set of commands is listed bellow

```
#Creation and activation of new environment
conda create -n detectron_env python = 3.6
conda activate detectron_env

#Dependencies installation
conda install pytorch cudatoolkit=11.0 -c pytorch
pip install torchvision torchaudio cython opencv-python

#Detectron2 installation
git clone https://github.com/facebookresearch/detectron2
cd detectron2
pip install -e .
```

3. Training

When all the annotated images are prepared and located in the current folder, the project files can be downloaded from our github repository with the following link:
https://github.com/Zabr-din/TER34_Mercantour_park_animal_detection

After that, you can run the train.py script from the terminal using the following command

```
python train.py.
```

In current version we assume that the *test.json, train.json* files are located in the same folder along with the *train* and *test* folders with the images. During the training process the folder called *output* and file called *IS_cfg.pickle* will appear in the folder. Those are model parameters and configurations, we will use them during the testing process.

4. Testing

For the testing files called test_video.py or test_image.py should be called from terminal depending on what content you are going to try them. In the files itself you can change the path to the video or image file.