Pytorch Object Detection
Preparing Yolov5 Model for TAK ML

June 8th, 2023

You will need to create a Zip file with the following structure contents:
1. takml_config.yaml - key value mapping to file

2. your model

3. labels file

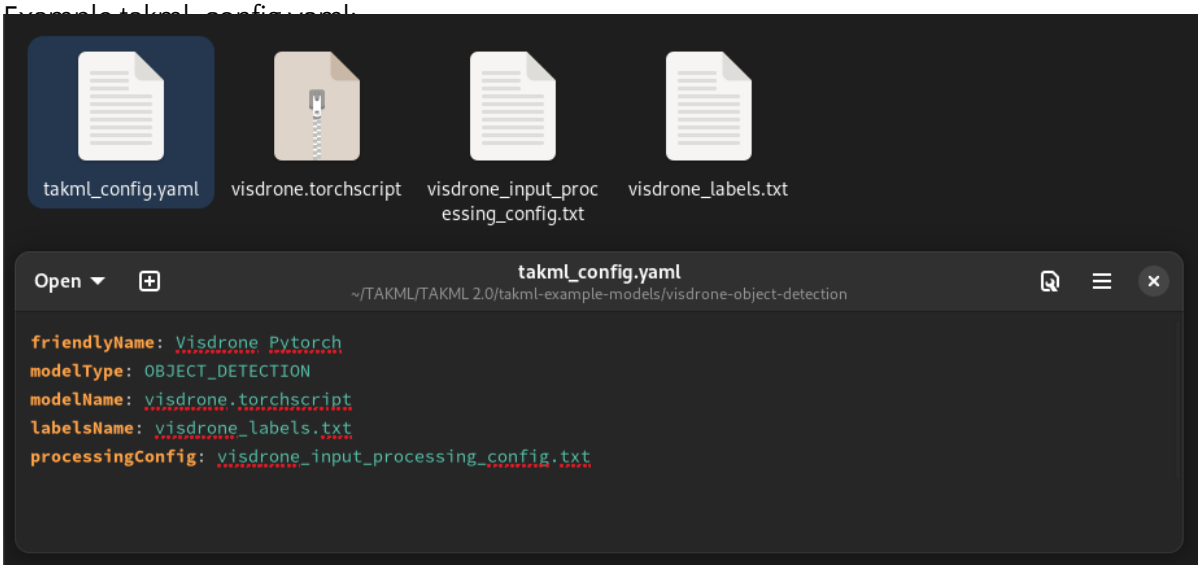
4. your processing config file

1. takml_config.yaml

This file must have the name "takml_config.yaml." The contents include pointers to each of your related files. Please add the following:

```
friendlyName: [friendly name for model]
modelType: OBJECT_DETECTION
modelName: [name of your model file]
labelsName: [name of your labels file, one class per line]
processingConfig: [name of your processing config file, see below for more info]
```

Example takml_config.yaml:



2. Model File

Yolov5 comes with a Pytorch to Torchscript converter,
Run the following command:

```
python export.py --weights /path/to/model.pt --include torchscript --
optimize --data PATH_TO_DATASET.yaml --imgsz CUSTOM_HEIGHT CUSTOM_WIDTH
```

640 is a decent `CUSTOM_HEIGHT/CUSTOM_WIDTH` value. This maps to the **modelInputHeight/modelInputWidth** defined in the Processing Config later.

`PATH_TO_DATASET` should be **data/[your yaml].yaml**.

Note, the model output shape.. e.g.:

```
PyTorch: starting from ../best.pt with output shape (1, 25200, 15) (13.7 MB)
```

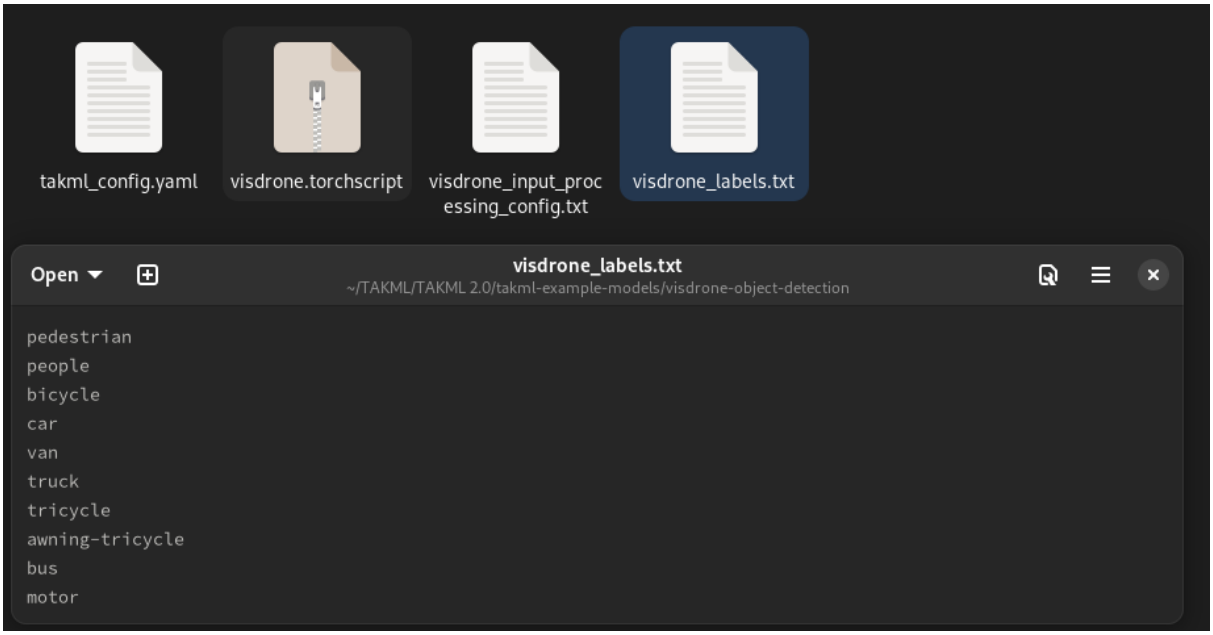
`25200` will be used as the **`tensorOutputRows`** defined in the Processing Config later (represents number of rows produced by tensor)

`15` will be used as the **`tensorOutputNumberColumns`** defined in the Processing Config later (represents #classes + 5 (bounding box and confidence being the last 5 columns))

The output torchscript file is now compatible with Pytorch/Android.

3. Labels File

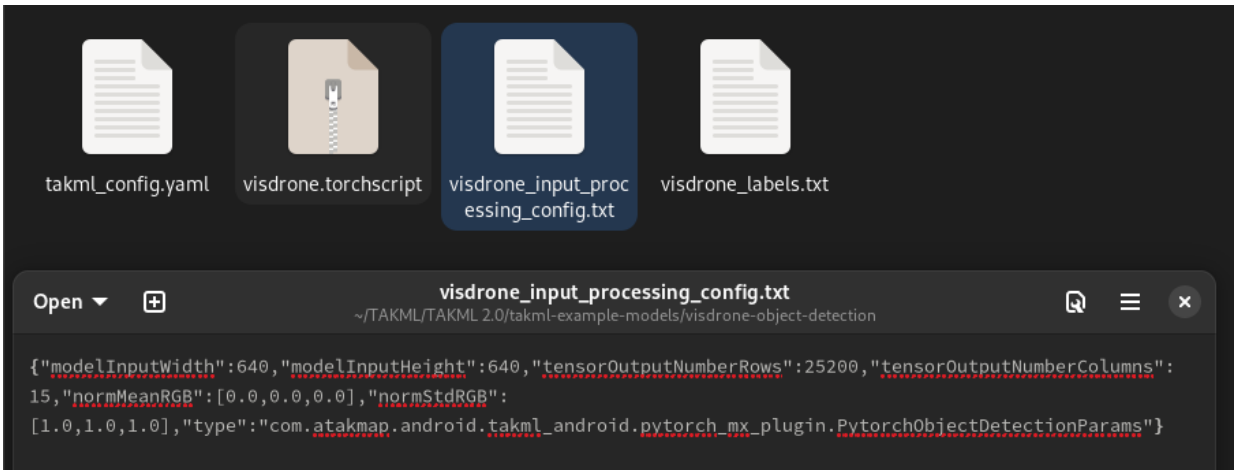
The labels file is a list of classes that the model produces, one per line. For example:



4. Labels File

You will need to set the processing config based on the values from the Model File section (e.g. visdrone_input_processing_config.txt). In particular: **modelInputWidth, modelInputHeight, `tensorOutputRows,tensorOutputColumns`**

See image below for example:



Finally, zip the contents, copy to your phone's SD Card, and import into ATAK. You can use ATAK's import utility.

Please see the **TAK ML Example MLA Plugin** for example usage of a Pytorch Object Detection Model (VisDrone).