Getting Started with Detectron2

This document provides a brief intro of the usage of builtin command-line tools in detectron2.

For a tutorial that involves actual coding with the API, see our Colab Notebook which covers how to run inference with an existing model, and how to train a builtin model on a custom dataset.

For more advanced tutorials, refer to our documentation.

Inference Demo with Pre-trained Models

1. Pick a model and its config file from model zoo, for example, `mask_rcnn_R_50_FPN_3x.yaml`.
2. We provide `demo.py` that is able to run builtin standard models. Run it with:

```
cd demo/
python demo.py --config-file ../configs/COCO-
InstanceSegmentation/mask_rcnn_R_50_FPN_3x.yaml \
  --input input1.jpg input2.jpg \
  [--other-options]
  --opts MODEL.WEIGHTS detectron2://COCO-
InstanceSegmentation/mask_rcnn_R_50_FPN_3x/137849600/model_final_f10217.pkl
```

The configs are made for training, therefore we need to specify `MODEL.WEIGHTS` to a model from model zoo for evaluation. This command will run the inference and show visualizations in an OpenCV window.

For details of the command line arguments, see `demo.py -h` or look at its source code to understand its behavior. Some common arguments are:

- To run **on your webcam**, replace `--input files` with `--webcam`.
- To run **on a video**, replace `--input files` with `--video-input video.mp4`.
- To run **on cpu**, add `MODEL.DEVICE cpu` after `--opts`.
- To save outputs to a directory (for images) or a file (for webcam or video), use `--output`.

Training & Evaluation in Command Line

We provide a script in "tools/{,plain_}train_net.py", that is made to train all the configs provided in detectron2. You may want to use it as a reference to write your own training script.

To train a model with "train_net.py", first setup the corresponding datasets following datasets/README.md, then run:

```
cd tools/
./train_net.py --num-gpus 8 \
  --config-file ../configs/COCO-InstanceSegmentation/mask_rcnn_R_50_FPN_1x.yaml
```

The configs are made for 8-GPU training. To train on 1 GPU, you may need to change some parameters, e.g.:

```
./train_net.py \
  --config-file ../configs/COCO-InstanceSegmentation/mask_rcnn_R_50_FPN_1x.yaml \
  --num-gpus 1 SOLVER.IMS_PER_BATCH 2 SOLVER.BASE_LR 0.0025
```

For most models, CPU training is not supported.

To evaluate a model's performance, use

```
./train_net.py \
  --config-file ../configs/COCO-InstanceSegmentation/mask_rcnn_R_50_FPN_1x.yaml \
  --eval-only MODEL.WEIGHTS /path/to/checkpoint_file
```

For more options, see `./train_net.py -h`.

Use Detectron2 APIs in Your Code

See our Colab Notebook to learn how to use detectron2 APIs to:

1. run inference with an existing model
2. train a builtin model on a custom dataset

See detectron2/projects for more ways to build your project on detectron2.