Tensorflow faster-rcnn模型转换和验证

基础环境

- python 3.5.x
- tensorflow>=1.10.0（最好别用2.0以上的版本）
- linux

1. **环境配置**

   1）cd scripts

   2）执行install lib

   ./install_lib.sh nntc

   3）执行环境配置脚本
   source envsetup_pcie.sh

   4）安装驱动
   sudo ./install_driver_pcie.sh

   5）cd ..

2. **模型转换**

   执行下面的命令

   python3 -m bmnett --model=frozen_inference_graph.pb(*模型路径) --input_names="image_tensor" --shapes=[1,608,608,3] --descs=[0,uint8,0,256] --net_name="graph" --outdir="out" --target="BM1684" --mode="compile" --dyn=True --enable_profile=false --seed="0" --opt=2 --cmp=true

   这个过程需要20分钟左右，如下面所示的输出，表示模型转换成功。模型生成在out目录中。

```
======== write binary ir to buffer ========
subnet_ir_len 1524 fw_ir_length 1524
======== call_cmodel_and_compare ==========
N = 100    C = 4    H = 1    W = 1    type = 0    constant = 0.000000    pad N = (0 0)    pad C = (0 0)    pad H
layer length = 400, 0, 0
======== generate compiler IR =============
======== write binary ir to buffer ========
subnet_ir_len 1140 fw_ir_length 1140
======== call_cmodel_and_compare ==========
N = 100    C = 1    H = 1    W = 1    type = 0    constant = 0.000000    pad N = (0 0)    pad C = (0 0)    pad H
layer length = 100, 0, 0
======== generate compiler IR =============
======== write binary ir to buffer ========
subnet_ir_len 1140 fw_ir_length 1140
======== call_cmodel_and_compare ==========
N = 100    C = 1    H = 1    W = 1    type = 0    constant = 0.000000    pad N = (0 0)    pad C = (0 0)    pad H
layer length = 100, 0, 0
======== generate compiler IR =============
======== write binary ir to buffer ========
subnet_ir_len 728 fw_ir_length 752
======== call_cmodel_and_compare ==========
======== generate compiler IR =============
======== write binary ir to buffer ========
subnet_ir_len 1468 fw_ir_length 1516
======== call_cmodel_and_compare ==========
layer length = 400, 0, 0
layer length = 100, 0, 0
layer length = 100, 0, 0
layer length = 100, 0, 0
layer length = 1, 0, 0

============================================================
*** Store bmodel of BMCompiler...
============================================================
BMLIB Send Quit Message
Compiling succeeded.
bitmain@bitmain-pcie:~/anbl/zhy/bmnnsdk2-bm1684_v2.0.3$ ls
bin  bmlang  bmnet  docker_run_bmnnsdk.sh  documents  driver  examples  frozen_inference_graph.pb  include  install  lib  out  res  scripts  test
bitmain@bitmain-pcie:~/anbl/zhy/bmnnsdk2-bm1684_v2.0.3$ ls out/
compilation.bmodel  input_ref_data.dat  output_ref_data.dat
bitmain@bitmain-pcie:~/anbl/zhy/bmnnsdk2-bm1684_v2.0.3$
```

3. **模型验证**

   1）设置多线程优化

export BM_CPU_LAYER_NUM_THREAD=4 (这个数最好是cat /proc/cpuinfo里看到的实际的cpu 核数)

2）打开icache

cd bin/x86

执行 ./test_update_fw ./bm168x_bmdnn_en_icache.bin ./bm168x_bmdnn_s_en_icache.bin 0

```
bitmain@bitmain-pcie:~/anbl/lingguang/bmnnsdk2-bm1684_v2.0.3$ cd bin/x86/
bitmain@bitmain-pcie:~/anbl/lingguang/bmnnsdk2-bm1684_v2.0.3/bin/x86$  ./test_update_fw ./bm168x_bmdnn_en_icache.bin ./bm168x_bmdnn_s_en_icache.bin 0
./test_update_fw
input itcm file ./bm168x_bmdnn_en_icache.bin ddr file ./bm168x_bmdnn_s_en_icache.bin
itcm size 373464 ddr size 820432
update firmware successfully.
```

cd ../../

3）执行模型

执行命令 bmrt_test --bmodel out/compilation.bmodel

```
bitmain@bitmain-pcie:~/anbl/lingguang/bmnnsdk2-bm1684_v2.0.3$ bmrt_test --bmodel out/compilation.bmodel
[BMRT][deal_with_options:1279] INFO : Loop num: 1
bmcpu init: skip cpu_user_defined
open usercpu.so, init user_cpu_init
[BMRT][load_bmodel:677] INFO : Loading bmodel from [out/compilation.bmodel]. Thanks for your patience...
[BMRT][load_bmodel:659] INFO : pre net num: 0, load net num: 1
[BMRT][bmrt_test:845] INFO : ==> running network #0, name: graph, loop: 0
[BMRT][bmrt_test:974] INFO : net[graph] stage[0], launch total time is 648137 us (npu 373769 us, cpu 274368 us)
[BMRT][bmrt_test:994] INFO : +++ The network[graph] stage[0] output_data +++
[BMRT][bmrt_test:1011] INFO : load input time(s): 0.000642
[BMRT][bmrt_test:1012] INFO : calculate  time(s): 0.648140
[BMRT][bmrt_test:1013] INFO : get output time(s): 0.000274
[BMRT][bmrt_test:1014] INFO : compare    time(s): 0.000103
bitmain@bitmain-pcie:~/anbl/lingguang/bmnnsdk2-bm1684_v2.0.3$
```