1.snpe 官网下载安装包,各种版本,Downloas-->Software-->Actlive https://developer.qualcomm.com/sites/default/files/docs/snpe/tutorial_alexnet.html

2.pip 安装依赖包

Package	Version
certifi	2021.5.30
commonmark	0.9.1
cycler	0.11.0
dataclasses	0.8
decorator	4.4.2
docutils	0.18.1
	22.9.24
_	2.15.0
Jinja2	3.0.3
	1.3.1
•	2.0.1
matplotlib	3.3.4
networkx	2.5.1
numpy	1.19.5
onnx	1.6.0
	0.4.8
onnxruntime	1.10.0
opencv-python Pillow	3.4.4.19 8.4.0
pip	21.2.2
protobuf	3.6.0
Pygments	2.12.0
pyparsing	3.0.9
python-dateutil	2.8.2
PyWavelets	1.1.1
PyYAML	3.10
rich	12.6.0
	0.17.2
scipy	1.4.1
setuptools	59.5.0
six	1.16.0
Sphinx	1.2.2
tifffile	2020.9.3
typing_extensions	4.1.1

3.加入环境变量 gedit ~/.bashrc

export

LD_LIBRARY_PATH="/media/ymm/DATA1/software/snpe-1.51.0.2663/lib/x86_64-linux-clang:\$LD_LIBRARY_PATH"

export SNPE_ROOT=/media/ymm/DATA1/software/snpe-1.51.0.2663

export PATH="/media/ymm/DATA1/software/snpe-1.51.0.2663/bin/x86_64-linux-clang:\$PATH"

export PYTHONPATH=\$PYTHONPATH:/media/ymm/DATA1/software/snpe-1.51.0.2663/lib/python

export ANDROID_NDK_ROOT=~/Android/Sdk/ndk-bundle

source ~/.bashrc

4.运行 onnx 转 dlc,需要激活 onnx 环境,命令如下:

cd /media/ymm/DATA1/software/snpe-1.51.0.2663/bin

source envsetup.sh -o /home/ymm/anaconda3/envs/snpe/lib/python3.6/site-packages/onnx

此时,可能会出现如下错误:

/ymmi/anacondas/envs/snpe/tib/pythons.8/site-packages/onnx [INFO] Setting ONNX_HOME=/home/ymm/anaconda3/envs/snpe/lib/python3.6/site-packages/onnx [WARNING] Can't find ANDROID_NDK_ROOT or ndk-build. SNPE needs android ndk to build the Nat iveCppExample

若情况允许可以安装 Android Studio ,下载 ANDROID_NDK ,指定 ANDROID_NDK_ROOT,如没有,对于模型转换这一步也没影响的。

export ANDROID_NDK_ROOT=~/Android/Sdk/ndk-bundle

5.进行模型转换

cd /media/ymm/DATA1/software/snpe-1.51.0.2663/bin/x86_64-linux-clang

./snpe-onnx-to-dl -i model.onnx -o model.dlc

若模型转换成功,会出现下面界面

2022-10-26 17:26:56,997 - 188 - INFO - INFO_DLC_SAVE_LOCATION: Saving model at /media/ymm/D ATA1/HandGesture/hands_detection/handgesture_classified_qqqqqqqqq,dlc 2022-10-26 17:26:58,795 - 188 - INFO - INFO_CONVERSION_SUCCESS: Conversion completed succes sfully

若转换不成功,尝试一下 onnxsim,命令如下: python3 -m onnxsim model.onnx model_sim.onnx

再次执行 ./snpe-onnx-to-dl -i model_sim.onnx -o model.dlc

若仍然转换不成功,可分析模型算子是否支持,修改算子等。

以上为 snpe-1.51 配置过程,目前 snpe-1.65 支持 snpe-pytorch-to-dlc.。可参考 https://developer.qualcomm.com/sites/default/files/docs/snpe/model_conv_pytorch.html

与以上不同的是:

1) pip list (多了一些依赖库) pip install hypothesis pytest torchvision==0.9

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2) 环境变量:

export

LD_LIBRARY_PATH="/media/ymm/DATA1/software/snpe-1.65.0.3676/lib/x86_64-linux-clang:\$LD_LIBRARY_PATH"

export SNPE_ROOT=/media/ymm/DATA1/software/snpe-1.65.0.3676

export PATH="/media/ymm/DATA1/software/snpe-1.65.0.3676/bin/x86_64-linux-clang:\$PATH"

export PYTHONPATH = \$PYTHONPATH:/media/ymm/DATA1/software/snpe-1.65.0.3676/lib/python

export ANDROID_NDK_ROOT=~/Android/Sdk/ndk-bundle

3) 激活环境

source envsetup.sh -o /home/ymm/anaconda3/envs/snpe/lib/python3.6/site-packages/torch export ANDROID_NDK_ROOT=~/Android/Sdk/ndk-bundle

4)模型转换命令

./snpe-pytorch-to-dlc --input_network resnet18.pt --input_dim input "1,3,224,224" --output_path resnet18.dlc

注意:该部分的 torch 模型为 torch.jit.trace 后的模型,可用 libtorch 部署的模型。样例如下:

import torch

import torchvision.models as models

resnet18_model = models.resnet18()

input_shape = [1, 3, 224, 224]

input_data = torch.randn(input_shape)

script_model = torch.jit.trace(resnet18_model, input_data)

script_model.save("resnet18.pt")

snpe 模型量化

参考:

https://blog.csdn.net/Guo Python/article/details/127048810? spm=1001.2014.3001.5501

(1) 准备量化的输入图片数据: 首先从测试集中获取 N 张图片(N 的取值范围推荐在 50~200 之间),然后将图片转换成 raw 文件,转换脚本可参考

```
#!/usr/bin/python
# coding=utf8
# Author: guopei
import numpy as np
import os
import cv2
import shutil
import random
from tqdm import tqdm
def get_image_path_list(dataset_path_list, N):
 从数据集中随机抽取 N 张图片
 Args:
   dataset_path_list:
   N:
 Returns:
 .....
 image_path_list = []
 for dataset_path in dataset_path_list:
   for dir_path, _, file_names in os.walk(dataset_path):
     for file_name in file_names:
       # if 'input' not in file_name:
       # continue
       img_path = os.path.join(dir_path, file_name)
       image_path_list.append(img_path)
 random.shuffle(image_path_list)
 return image_path_list[:N]
def preprocess(image):
 对图片进行预处理,image 的通道顺序需要是 BGR
 Args:
   image:
 Returns:
 .....
```

```
image = np.array(image)
 #如果输出是float32,那么输入也一定要转换成float32
 image = cv2.resize(image, (528, 784), cv2.INTER_LINEAR)
 image = cv2.cvtColor(image, cv2.COLOR_BGR2YUV)
 image = image[:,:,0]
 image = image.astype(np.float32)
 # 归一化
 image = image / 255.
 return image
def convert(image_path_list, raw_data_dir_save_path):
 把图片转换成 raw 文件
 Args:
   image_path_list:
                       待转换的图片的路径列表
   raw data dir save path: raw 文件的保存路径
 Returns:
 .....
 if os.path.exists(raw_data_dir_save_path):
   shutil.rmtree(raw_data_dir_save_path)
 os.mkdir(raw data dir save path)
 raw_data_path_list_file = raw_data_dir_save_path + '_list.txt'
 if os.path.exists(raw data path list file):
   os.remove(raw_data_path_list_file)
 with open(raw_data_path_list_file, 'w') as f:
   for index, img_path in enumerate(image_path_list):
     raw name = os.path.basename(img_path).split('.')[0] + '.raw'
     raw_data_path = os.path.join(raw_data_dir_save_path, raw_name)
     f.write(raw_data_path + '\n')
     image = cv2.imread(img_path)
     image = preprocess(image)
     image.tofile(raw_data_path)
if __name__ == '__main__':
 image path list = get image path list(
   dataset_path_list=['/home/guopei/jpgs'], N=2)
 convert(image_path_list=image_path_list,
     raw_data_dir_save_path='./img_raws')
```

转换过程中需要注意以下几点:

- 一定要按照模型对输入数据的要求对图片进行预处理;
- 一定要将图片转换成 float32;

转化结束后,将得到一个包含所有 raw 文件的文件夹和一个包含所有 raw 文件 绝对路径的 list 文件。

(2) 模型量化:

snpe-dlc-quantize

- --input dlc my.dlc
- --input_list quantize_data_list.txt
- --output_dlc my_quant.dlc
- --optimizations cle --optimizations bc -enable_htp
- -input_list 就是上一步骤生成的包含所有 raw 文件绝对路径的 list 文件,
- -optimizations cle --optimizations bc 对应的量化算法效果最佳,但是这种量化算法对模型结构有一定的限制且量化速度较慢,如果使用这种量化算法出现量化失败,可以将-optimizations cle --optimizations bc 这两个选项去掉,使用 snpe 默认的量化算法。
- -enable_htp 选项一定需要, 否则 dsp 运行的初始化非常慢, 这里千万注意,官网没有介绍;

(3) 验证量化后的模型

snpe-net-run --container my_quant.dlc --input_list ./quantize_data_list.txt -output_dir ./my_dir

将得到的 raw 转换成图片,可参考代码:

import numpy as np import os import cv2 import shutil

def postProcess(net_output):
 predEdge = (net_output[..., 0:1] * 255).astype(np.uint8)
 predSegment = (net_output[..., 1:2] * 255).astype(np.uint8)
 return predEdge, predSegment

```
def convert(raw_data_dir_path, converted_image_dir_save_path):
 if os.path.exists(converted_image_dir_save_path):
   shutil.rmtree(converted_image_dir_save_path)
 os.mkdir(converted image dir save path)
 count = 0
 for dir_path, _, filenames in os.walk(raw_data_dir_path):
   for filename in filenames:
     if 'raw' not in filename:
       continue
     raw_file_path = os.path.join(dir_path, filename)
     net_output = np.fromfile(raw_file_path, dtype='float32').reshape((384, 384, 2))
     predEdge, predSegment = postProcess(net_output)
                 edge_save_path = os.path.join(converted_image_dir_save_path,
str(count).zfill(3) + '_output1.jpg')
              segment_save_path = os.path.join(converted_image_dir_save_path,
str(count).zfill(3) + '_output2.jpg')
     print(edge_save_path)
     count += 1
     cv2.imwrite(edge_save_path, predEdge)
     cv2.imwrite(segment_save_path, predSegment)
if __name__ == '__main__':
 raw data dir path = 'dlc output now'
 converted_image_dir_save_path = raw_data_dir_path + '_convert'
 convert(raw_data_dir_path, converted_image_dir_save_path)
```