new

December 15, 2019

[2]:
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from vision.ssd.vgg_ssd import create_vgg_ssd
from vision.ssd.mobilenetv1_ssd import create_mobilenetv1_ssd
from vision.ssd.mobilenetv1_ssd_lite import create_mobilenetv1_ssd_lite
from vision.ssd.squeezenet_ssd_lite import create_squeezenet_ssd_lite
from vision.ssd.mobilenet_v2_ssd_lite import create_mobilenetv2_ssd_lite

import sys
import torch.onnx
from caffe2.python.onnx.backend import Caffe2Backend as c2
import onnx


if len(sys.argv) < 3:
    print('Usage: python convert_to_caffe2_models.py <net type:␣
 ↪mobilenet-v1-ssd|others>  <model path>')
    sys.exit(0)
#net_type = sys.argv[1]
net_type = "mb1-ssd"
#model_path = sys.argv[2]
model_path = "models/gun_model_2.21.pth"

#label_path = sys.argv[3]
label_path = "models/open-images-model-labels.txt"

class_names = [name.strip() for name in open(label_path).readlines()]
num_classes = len(class_names)

if net_type == 'vgg16-ssd':
    net = create_vgg_ssd(len(class_names), is_test=True)
elif net_type == 'mb1-ssd':
    net = create_mobilenetv1_ssd(len(class_names), is_test=True)
elif net_type == 'mb1-ssd-lite':
    net = create_mobilenetv1_ssd_lite(len(class_names), is_test=True)
elif net_type == 'mb2-ssd-lite':
    net = create_mobilenetv2_ssd_lite(len(class_names), is_test=True)
elif net_type == 'sq-ssd-lite':
    net = create_squeezenet_ssd_lite(len(class_names), is_test=True)
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else:
    print("The net type is wrong. It should be one of vgg16-ssd, mb1-ssd and␣
 ↪mb1-ssd-lite.")
    sys.exit(1)
net.load(model_path)
net.eval()

model_path = f"models/{net_type}.onnx"
init_net_path = f"models/{net_type}_init_net.pb"
init_net_txt_path = f"models/{net_type}_init_net.pbtxt"
predict_net_path = f"models/{net_type}_predict_net.pb"
predict_net_txt_path = f"models/{net_type}_predict_net.pbtxt"

dummy_input = torch.randn(1, 3, 300, 300)
torch.onnx.export(net, dummy_input, model_path, verbose=True,␣
 ↪output_names=['scores', 'boxes'])
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graph(%input.1 : Float(1, 3, 300, 300),
      %base_net.0.0.weight : Float(32, 3, 3, 3),
      %base_net.0.1.weight : Float(32),
      %base_net.0.1.bias : Float(32),
      %base_net.0.1.running_mean : Float(32),
      %base_net.0.1.running_var : Float(32),
      %base_net.0.1.num_batches_tracked : Long(),
      %base_net.1.0.weight : Float(32, 1, 3, 3),
      %base_net.1.1.weight : Float(32),
      %base_net.1.1.bias : Float(32),
      %base_net.1.1.running_mean : Float(32),
      %base_net.1.1.running_var : Float(32),
      %base_net.1.1.num_batches_tracked : Long(),
      %base_net.1.3.weight : Float(64, 32, 1, 1),
      %base_net.1.4.weight : Float(64),
      %base_net.1.4.bias : Float(64),
      %base_net.1.4.running_mean : Float(64),
      %base_net.1.4.running_var : Float(64),
      %base_net.1.4.num_batches_tracked : Long(),
      %base_net.2.0.weight : Float(64, 1, 3, 3),
      %base_net.2.1.weight : Float(64),
      %base_net.2.1.bias : Float(64),
      %base_net.2.1.running_mean : Float(64),
      %base_net.2.1.running_var : Float(64),
      %base_net.2.1.num_batches_tracked : Long(),
      %base_net.2.3.weight : Float(128, 64, 1, 1),
      %base_net.2.4.weight : Float(128),
      %base_net.2.4.bias : Float(128),
      %base_net.2.4.running_mean : Float(128),
      %base_net.2.4.running_var : Float(128),
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%base_net.2.4.num_batches_tracked : Long(),
%base_net.3.0.weight : Float(128, 1, 3, 3),
%base_net.3.1.weight : Float(128),
%base_net.3.1.bias : Float(128),
%base_net.3.1.running_mean : Float(128),
%base_net.3.1.running_var : Float(128),
%base_net.3.1.num_batches_tracked : Long(),
%base_net.3.3.weight : Float(128, 128, 1, 1),
%base_net.3.4.weight : Float(128),
%base_net.3.4.bias : Float(128),
%base_net.3.4.running_mean : Float(128),
%base_net.3.4.running_var : Float(128),
%base_net.3.4.num_batches_tracked : Long(),
%base_net.4.0.weight : Float(128, 1, 3, 3),
%base_net.4.1.weight : Float(128),
%base_net.4.1.bias : Float(128),
%base_net.4.1.running_mean : Float(128),
%base_net.4.1.running_var : Float(128),
%base_net.4.1.num_batches_tracked : Long(),
%base_net.4.3.weight : Float(256, 128, 1, 1),
%base_net.4.4.weight : Float(256),
%base_net.4.4.bias : Float(256),
%base_net.4.4.running_mean : Float(256),
%base_net.4.4.running_var : Float(256),
%base_net.4.4.num_batches_tracked : Long(),
%base_net.5.0.weight : Float(256, 1, 3, 3),
%base_net.5.1.weight : Float(256),
%base_net.5.1.bias : Float(256),
%base_net.5.1.running_mean : Float(256),
%base_net.5.1.running_var : Float(256),
%base_net.5.1.num_batches_tracked : Long(),
%base_net.5.3.weight : Float(256, 256, 1, 1),
%base_net.5.4.weight : Float(256),
%base_net.5.4.bias : Float(256),
%base_net.5.4.running_mean : Float(256),
%base_net.5.4.running_var : Float(256),
%base_net.5.4.num_batches_tracked : Long(),
%base_net.6.0.weight : Float(256, 1, 3, 3),
%base_net.6.1.weight : Float(256),
%base_net.6.1.bias : Float(256),
%base_net.6.1.running_mean : Float(256),
%base_net.6.1.running_var : Float(256),
%base_net.6.1.num_batches_tracked : Long(),
%base_net.6.3.weight : Float(512, 256, 1, 1),
%base_net.6.4.weight : Float(512),
%base_net.6.4.bias : Float(512),
%base_net.6.4.running_mean : Float(512),
%base_net.6.4.running_var : Float(512),
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%base_net.6.4.num_batches_tracked : Long(),
%base_net.7.0.weight : Float(512, 1, 3, 3),
%base_net.7.1.weight : Float(512),
%base_net.7.1.bias : Float(512),
%base_net.7.1.running_mean : Float(512),
%base_net.7.1.running_var : Float(512),
%base_net.7.1.num_batches_tracked : Long(),
%base_net.7.3.weight : Float(512, 512, 1, 1),
%base_net.7.4.weight : Float(512),
%base_net.7.4.bias : Float(512),
%base_net.7.4.running_mean : Float(512),
%base_net.7.4.running_var : Float(512),
%base_net.7.4.num_batches_tracked : Long(),
%base_net.8.0.weight : Float(512, 1, 3, 3),
%base_net.8.1.weight : Float(512),
%base_net.8.1.bias : Float(512),
%base_net.8.1.running_mean : Float(512),
%base_net.8.1.running_var : Float(512),
%base_net.8.1.num_batches_tracked : Long(),
%base_net.8.3.weight : Float(512, 512, 1, 1),
%base_net.8.4.weight : Float(512),
%base_net.8.4.bias : Float(512),
%base_net.8.4.running_mean : Float(512),
%base_net.8.4.running_var : Float(512),
%base_net.8.4.num_batches_tracked : Long(),
%base_net.9.0.weight : Float(512, 1, 3, 3),
%base_net.9.1.weight : Float(512),
%base_net.9.1.bias : Float(512),
%base_net.9.1.running_mean : Float(512),
%base_net.9.1.running_var : Float(512),
%base_net.9.1.num_batches_tracked : Long(),
%base_net.9.3.weight : Float(512, 512, 1, 1),
%base_net.9.4.weight : Float(512),
%base_net.9.4.bias : Float(512),
%base_net.9.4.running_mean : Float(512),
%base_net.9.4.running_var : Float(512),
%base_net.9.4.num_batches_tracked : Long(),
%base_net.10.0.weight : Float(512, 1, 3, 3),
%base_net.10.1.weight : Float(512),
%base_net.10.1.bias : Float(512),
%base_net.10.1.running_mean : Float(512),
%base_net.10.1.running_var : Float(512),
%base_net.10.1.num_batches_tracked : Long(),
%base_net.10.3.weight : Float(512, 512, 1, 1),
%base_net.10.4.weight : Float(512),
%base_net.10.4.bias : Float(512),
%base_net.10.4.running_mean : Float(512),
%base_net.10.4.running_var : Float(512),
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%base_net.10.4.num_batches_tracked : Long(),
%base_net.11.0.weight : Float(512, 1, 3, 3),
%base_net.11.1.weight : Float(512),
%base_net.11.1.bias : Float(512),
%base_net.11.1.running_mean : Float(512),
%base_net.11.1.running_var : Float(512),
%base_net.11.1.num_batches_tracked : Long(),
%base_net.11.3.weight : Float(512, 512, 1, 1),
%base_net.11.4.weight : Float(512),
%base_net.11.4.bias : Float(512),
%base_net.11.4.running_mean : Float(512),
%base_net.11.4.running_var : Float(512),
%base_net.11.4.num_batches_tracked : Long(),
%base_net.12.0.weight : Float(512, 1, 3, 3),
%base_net.12.1.weight : Float(512),
%base_net.12.1.bias : Float(512),
%base_net.12.1.running_mean : Float(512),
%base_net.12.1.running_var : Float(512),
%base_net.12.1.num_batches_tracked : Long(),
%base_net.12.3.weight : Float(1024, 512, 1, 1),
%base_net.12.4.weight : Float(1024),
%base_net.12.4.bias : Float(1024),
%base_net.12.4.running_mean : Float(1024),
%base_net.12.4.running_var : Float(1024),
%base_net.12.4.num_batches_tracked : Long(),
%base_net.13.0.weight : Float(1024, 1, 3, 3),
%base_net.13.1.weight : Float(1024),
%base_net.13.1.bias : Float(1024),
%base_net.13.1.running_mean : Float(1024),
%base_net.13.1.running_var : Float(1024),
%base_net.13.1.num_batches_tracked : Long(),
%base_net.13.3.weight : Float(1024, 1024, 1, 1),
%base_net.13.4.weight : Float(1024),
%base_net.13.4.bias : Float(1024),
%base_net.13.4.running_mean : Float(1024),
%base_net.13.4.running_var : Float(1024),
%base_net.13.4.num_batches_tracked : Long(),
%extras.0.0.weight : Float(256, 1024, 1, 1),
%extras.0.0.bias : Float(256),
%extras.0.2.weight : Float(512, 256, 3, 3),
%extras.0.2.bias : Float(512),
%extras.1.0.weight : Float(128, 512, 1, 1),
%extras.1.0.bias : Float(128),
%extras.1.2.weight : Float(256, 128, 3, 3),
%extras.1.2.bias : Float(256),
%extras.2.0.weight : Float(128, 256, 1, 1),
%extras.2.0.bias : Float(128),
%extras.2.2.weight : Float(256, 128, 3, 3),
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      %extras.2.2.bias : Float(256),
      %extras.3.0.weight : Float(128, 256, 1, 1),
      %extras.3.0.bias : Float(128),
      %extras.3.2.weight : Float(256, 128, 3, 3),
      %extras.3.2.bias : Float(256),
      %classification_headers.0.weight : Float(18, 512, 3, 3),
      %classification_headers.0.bias : Float(18),
      %classification_headers.1.weight : Float(18, 1024, 3, 3),
      %classification_headers.1.bias : Float(18),
      %classification_headers.2.weight : Float(18, 512, 3, 3),
      %classification_headers.2.bias : Float(18),
      %classification_headers.3.weight : Float(18, 256, 3, 3),
      %classification_headers.3.bias : Float(18),
      %classification_headers.4.weight : Float(18, 256, 3, 3),
      %classification_headers.4.bias : Float(18),
      %classification_headers.5.weight : Float(18, 256, 3, 3),
      %classification_headers.5.bias : Float(18),
      %regression_headers.0.weight : Float(24, 512, 3, 3),
      %regression_headers.0.bias : Float(24),
      %regression_headers.1.weight : Float(24, 1024, 3, 3),
      %regression_headers.1.bias : Float(24),
      %regression_headers.2.weight : Float(24, 512, 3, 3),
      %regression_headers.2.bias : Float(24),
      %regression_headers.3.weight : Float(24, 256, 3, 3),
      %regression_headers.3.bias : Float(24),
      %regression_headers.4.weight : Float(24, 256, 3, 3),
      %regression_headers.4.bias : Float(24),
      %regression_headers.5.weight : Float(24, 256, 3, 3),
      %regression_headers.5.bias : Float(24)):
  %203 : Float(1, 32, 150, 150) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[2, 2]](%input.1,
%base_net.0.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %204 : Float(1, 32, 150, 150) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%203, %base_net.0.1.weight, %base_net.0.1.bias,
%base_net.0.1.running_mean, %base_net.0.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %205 : Float(1, 32, 150, 150) = onnx::Relu(%204), scope:
SSD/Sequential/ReLU[2] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:911:0
  %206 : Float(1, 32, 150, 150) = onnx::Conv[dilations=[1, 1], group=32,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%205,
%base_net.1.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %207 : Float(1, 32, 150, 150) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%206, %base_net.1.1.weight, %base_net.1.1.bias,
%base_net.1.1.running_mean, %base_net.1.1.running_var), scope:
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SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %208 : Float(1, 32, 150, 150) = onnx::Relu(%207), scope:
SSD/Sequential/ReLU[2] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:911:0
  %209 : Float(1, 64, 150, 150) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%208,
%base_net.1.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %210 : Float(1, 64, 150, 150) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%209, %base_net.1.4.weight, %base_net.1.4.bias,
%base_net.1.4.running_mean, %base_net.1.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %211 : Float(1, 64, 150, 150) = onnx::Relu(%210), scope:
SSD/Sequential/ReLU[5] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:911:0
  %212 : Float(1, 64, 75, 75) = onnx::Conv[dilations=[1, 1], group=64,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[2, 2]](%211,
%base_net.2.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %213 : Float(1, 64, 75, 75) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%212, %base_net.2.1.weight, %base_net.2.1.bias,
%base_net.2.1.running_mean, %base_net.2.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %214 : Float(1, 64, 75, 75) = onnx::Relu(%213), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %215 : Float(1, 128, 75, 75) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%214,
%base_net.2.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %216 : Float(1, 128, 75, 75) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%215, %base_net.2.4.weight, %base_net.2.4.bias,
%base_net.2.4.running_mean, %base_net.2.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %217 : Float(1, 128, 75, 75) = onnx::Relu(%216), scope: SSD/Sequential/ReLU[5]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %218 : Float(1, 128, 75, 75) = onnx::Conv[dilations=[1, 1], group=128,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%217,
%base_net.3.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %219 : Float(1, 128, 75, 75) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%218, %base_net.3.1.weight, %base_net.3.1.bias,
%base_net.3.1.running_mean, %base_net.3.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
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  %220 : Float(1, 128, 75, 75) = onnx::Relu(%219), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %221 : Float(1, 128, 75, 75) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%220,
%base_net.3.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %222 : Float(1, 128, 75, 75) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%221, %base_net.3.4.weight, %base_net.3.4.bias,
%base_net.3.4.running_mean, %base_net.3.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %223 : Float(1, 128, 75, 75) = onnx::Relu(%222), scope: SSD/Sequential/ReLU[5]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %224 : Float(1, 128, 38, 38) = onnx::Conv[dilations=[1, 1], group=128,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[2, 2]](%223,
%base_net.4.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %225 : Float(1, 128, 38, 38) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%224, %base_net.4.1.weight, %base_net.4.1.bias,
%base_net.4.1.running_mean, %base_net.4.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %226 : Float(1, 128, 38, 38) = onnx::Relu(%225), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %227 : Float(1, 256, 38, 38) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%226,
%base_net.4.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %228 : Float(1, 256, 38, 38) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%227, %base_net.4.4.weight, %base_net.4.4.bias,
%base_net.4.4.running_mean, %base_net.4.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %229 : Float(1, 256, 38, 38) = onnx::Relu(%228), scope: SSD/Sequential/ReLU[5]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %230 : Float(1, 256, 38, 38) = onnx::Conv[dilations=[1, 1], group=256,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%229,
%base_net.5.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %231 : Float(1, 256, 38, 38) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%230, %base_net.5.1.weight, %base_net.5.1.bias,
%base_net.5.1.running_mean, %base_net.5.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %232 : Float(1, 256, 38, 38) = onnx::Relu(%231), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %233 : Float(1, 256, 38, 38) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%232,
```

```
%base_net.5.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %234 : Float(1, 256, 38, 38) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%233, %base_net.5.4.weight, %base_net.5.4.bias,
%base_net.5.4.running_mean, %base_net.5.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %235 : Float(1, 256, 38, 38) = onnx::Relu(%234), scope: SSD/Sequential/ReLU[5]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %236 : Float(1, 256, 19, 19) = onnx::Conv[dilations=[1, 1], group=256,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[2, 2]](%235,
%base_net.6.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %237 : Float(1, 256, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%236, %base_net.6.1.weight, %base_net.6.1.bias,
%base_net.6.1.running_mean, %base_net.6.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %238 : Float(1, 256, 19, 19) = onnx::Relu(%237), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %239 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%238,
%base_net.6.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %240 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%239, %base_net.6.4.weight, %base_net.6.4.bias,
%base_net.6.4.running_mean, %base_net.6.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %241 : Float(1, 512, 19, 19) = onnx::Relu(%240), scope: SSD/Sequential/ReLU[5]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %242 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=512,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%241,
%base_net.7.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %243 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%242, %base_net.7.1.weight, %base_net.7.1.bias,
%base_net.7.1.running_mean, %base_net.7.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %244 : Float(1, 512, 19, 19) = onnx::Relu(%243), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %245 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%244,
%base_net.7.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %246 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%245, %base_net.7.4.weight, %base_net.7.4.bias,
```

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%base_net.7.4.running_mean, %base_net.7.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %247 : Float(1, 512, 19, 19) = onnx::Relu(%246), scope: SSD/Sequential/ReLU[5]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %248 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=512,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%247,
%base_net.8.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %249 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%248, %base_net.8.1.weight, %base_net.8.1.bias,
%base_net.8.1.running_mean, %base_net.8.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %250 : Float(1, 512, 19, 19) = onnx::Relu(%249), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %251 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%250,
%base_net.8.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %252 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%251, %base_net.8.4.weight, %base_net.8.4.bias,
%base_net.8.4.running_mean, %base_net.8.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %253 : Float(1, 512, 19, 19) = onnx::Relu(%252), scope: SSD/Sequential/ReLU[5]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %254 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=512,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%253,
%base_net.9.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %255 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%254, %base_net.9.1.weight, %base_net.9.1.bias,
%base_net.9.1.running_mean, %base_net.9.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %256 : Float(1, 512, 19, 19) = onnx::Relu(%255), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %257 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%256,
%base_net.9.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %258 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%257, %base_net.9.4.weight, %base_net.9.4.bias,
%base_net.9.4.running_mean, %base_net.9.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %259 : Float(1, 512, 19, 19) = onnx::Relu(%258), scope: SSD/Sequential/ReLU[5]
```

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# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %260 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=512,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%259,
%base_net.10.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %261 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%260, %base_net.10.1.weight, %base_net.10.1.bias,
%base_net.10.1.running_mean, %base_net.10.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %262 : Float(1, 512, 19, 19) = onnx::Relu(%261), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %263 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%262,
%base_net.10.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %264 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%263, %base_net.10.4.weight, %base_net.10.4.bias,
%base_net.10.4.running_mean, %base_net.10.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %265 : Float(1, 512, 19, 19) = onnx::Relu(%264), scope: SSD/Sequential/ReLU[5]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %266 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=512,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%265,
%base_net.11.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %267 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%266, %base_net.11.1.weight, %base_net.11.1.bias,
%base_net.11.1.running_mean, %base_net.11.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %268 : Float(1, 512, 19, 19) = onnx::Relu(%267), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %269 : Float(1, 512, 19, 19) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%268,
%base_net.11.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %270 : Float(1, 512, 19, 19) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%269, %base_net.11.4.weight, %base_net.11.4.bias,
%base_net.11.4.running_mean, %base_net.11.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %271 : Float(1, 512, 19, 19) = onnx::Relu(%270), scope: SSD/Sequential/ReLU[5]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %272 : Float(1, 18, 19, 19) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%271,
%classification_headers.0.weight, %classification_headers.0.bias), scope:
```

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SSD/Conv2d # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/modules/conv.py:340:0
  %273 : Float(1, 19, 19, 18) = onnx::Transpose[perm=[0, 2, 3, 1]](%272), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:102:0
  %274 : Long() = onnx::Constant[value={0}](), scope: SSD
  %275 : Tensor = onnx::Shape(%273), scope: SSD
  %276 : Long() = onnx::Gather[axis=0](%275, %274), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %277 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %278 : Long() = onnx::Constant[value={3}](), scope: SSD
  %279 : Tensor = onnx::Unsqueeze[axes=[0]](%276)
  %280 : Tensor = onnx::Unsqueeze[axes=[0]](%277)
  %281 : Tensor = onnx::Unsqueeze[axes=[0]](%278)
  %282 : Tensor = onnx::Concat[axis=0](%279, %280, %281)
  %283 : Float(1, 2166, 3) = onnx::Reshape(%273, %282), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %284 : Float(1, 24, 19, 19) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%271,
%regression_headers.0.weight, %regression_headers.0.bias), scope: SSD/Conv2d #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %285 : Float(1, 19, 19, 24) = onnx::Transpose[perm=[0, 2, 3, 1]](%284), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:106:0
  %286 : Long() = onnx::Constant[value={0}](), scope: SSD
  %287 : Tensor = onnx::Shape(%285), scope: SSD
  %288 : Long() = onnx::Gather[axis=0](%287, %286), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %289 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %290 : Long() = onnx::Constant[value={4}](), scope: SSD
  %291 : Tensor = onnx::Unsqueeze[axes=[0]](%288)
  %292 : Tensor = onnx::Unsqueeze[axes=[0]](%289)
  %293 : Tensor = onnx::Unsqueeze[axes=[0]](%290)
  %294 : Tensor = onnx::Concat[axis=0](%291, %292, %293)
  %295 : Float(1, 2166, 4) = onnx::Reshape(%285, %294), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %296 : Float(1, 512, 10, 10) = onnx::Conv[dilations=[1, 1], group=512,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[2, 2]](%271,
%base_net.12.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %297 : Float(1, 512, 10, 10) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%296, %base_net.12.1.weight, %base_net.12.1.bias,
%base_net.12.1.running_mean, %base_net.12.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %298 : Float(1, 512, 10, 10) = onnx::Relu(%297), scope: SSD/Sequential/ReLU[2]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:911:0
  %299 : Float(1, 1024, 10, 10) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%298,
%base_net.12.3.weight), scope: SSD/Sequential/Conv2d[3] #
```

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/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %300 : Float(1, 1024, 10, 10) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%299, %base_net.12.4.weight, %base_net.12.4.bias,
%base_net.12.4.running_mean, %base_net.12.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %301 : Float(1, 1024, 10, 10) = onnx::Relu(%300), scope:
SSD/Sequential/ReLU[5] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:911:0
  %302 : Float(1, 1024, 10, 10) = onnx::Conv[dilations=[1, 1], group=1024,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%301,
%base_net.13.0.weight), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %303 : Float(1, 1024, 10, 10) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%302, %base_net.13.1.weight, %base_net.13.1.bias,
%base_net.13.1.running_mean, %base_net.13.1.running_var), scope:
SSD/Sequential/BatchNorm2d[1] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %304 : Float(1, 1024, 10, 10) = onnx::Relu(%303), scope:
SSD/Sequential/ReLU[2] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:911:0
  %305 : Float(1, 1024, 10, 10) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%304,
%base_net.13.3.weight), scope: SSD/Sequential/Conv2d[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %306 : Float(1, 1024, 10, 10) = onnx::BatchNormalization[epsilon=1e-05,
momentum=0.9](%305, %base_net.13.4.weight, %base_net.13.4.bias,
%base_net.13.4.running_mean, %base_net.13.4.running_var), scope:
SSD/Sequential/BatchNorm2d[4] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:1656:0
  %307 : Float(1, 1024, 10, 10) = onnx::Relu(%306), scope:
SSD/Sequential/ReLU[5] # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/functional.py:911:0
  %308 : Float(1, 18, 10, 10) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%307,
%classification_headers.1.weight, %classification_headers.1.bias), scope:
SSD/Conv2d # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/modules/conv.py:340:0
  %309 : Float(1, 10, 10, 18) = onnx::Transpose[perm=[0, 2, 3, 1]](%308), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:102:0
  %310 : Long() = onnx::Constant[value={0}](), scope: SSD
  %311 : Tensor = onnx::Shape(%309), scope: SSD
  %312 : Long() = onnx::Gather[axis=0](%311, %310), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %313 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %314 : Long() = onnx::Constant[value={3}](), scope: SSD
  %315 : Tensor = onnx::Unsqueeze[axes=[0]](%312)
  %316 : Tensor = onnx::Unsqueeze[axes=[0]](%313)
```

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  %317 : Tensor = onnx::Unsqueeze[axes=[0]](%314)
  %318 : Tensor = onnx::Concat[axis=0](%315, %316, %317)
  %319 : Float(1, 600, 3) = onnx::Reshape(%309, %318), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %320 : Float(1, 24, 10, 10) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%307,
%regression_headers.1.weight, %regression_headers.1.bias), scope: SSD/Conv2d #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %321 : Float(1, 10, 10, 24) = onnx::Transpose[perm=[0, 2, 3, 1]](%320), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:106:0
  %322 : Long() = onnx::Constant[value={0}](), scope: SSD
  %323 : Tensor = onnx::Shape(%321), scope: SSD
  %324 : Long() = onnx::Gather[axis=0](%323, %322), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %325 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %326 : Long() = onnx::Constant[value={4}](), scope: SSD
  %327 : Tensor = onnx::Unsqueeze[axes=[0]](%324)
  %328 : Tensor = onnx::Unsqueeze[axes=[0]](%325)
  %329 : Tensor = onnx::Unsqueeze[axes=[0]](%326)
  %330 : Tensor = onnx::Concat[axis=0](%327, %328, %329)
  %331 : Float(1, 600, 4) = onnx::Reshape(%321, %330), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %332 : Float(1, 256, 10, 10) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%307,
%extras.0.0.weight, %extras.0.0.bias), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %333 : Float(1, 256, 10, 10) = onnx::Relu(%332), scope: SSD/Sequential/ReLU[1]
# /opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:913:0
  %334 : Float(1, 512, 5, 5) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[2, 2]](%333,
%extras.0.2.weight, %extras.0.2.bias), scope: SSD/Sequential/Conv2d[2] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %335 : Float(1, 512, 5, 5) = onnx::Relu(%334), scope: SSD/Sequential/ReLU[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:913:0
  %336 : Float(1, 18, 5, 5) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%335,
%classification_headers.2.weight, %classification_headers.2.bias), scope:
SSD/Conv2d # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/modules/conv.py:340:0
  %337 : Float(1, 5, 5, 18) = onnx::Transpose[perm=[0, 2, 3, 1]](%336), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:102:0
  %338 : Long() = onnx::Constant[value={0}](), scope: SSD
  %339 : Tensor = onnx::Shape(%337), scope: SSD
  %340 : Long() = onnx::Gather[axis=0](%339, %338), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %341 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %342 : Long() = onnx::Constant[value={3}](), scope: SSD
  %343 : Tensor = onnx::Unsqueeze[axes=[0]](%340)
```

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  %344 : Tensor = onnx::Unsqueeze[axes=[0]](%341)
  %345 : Tensor = onnx::Unsqueeze[axes=[0]](%342)
  %346 : Tensor = onnx::Concat[axis=0](%343, %344, %345)
  %347 : Float(1, 150, 3) = onnx::Reshape(%337, %346), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %348 : Float(1, 24, 5, 5) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%335,
%regression_headers.2.weight, %regression_headers.2.bias), scope: SSD/Conv2d #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %349 : Float(1, 5, 5, 24) = onnx::Transpose[perm=[0, 2, 3, 1]](%348), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:106:0
  %350 : Long() = onnx::Constant[value={0}](), scope: SSD
  %351 : Tensor = onnx::Shape(%349), scope: SSD
  %352 : Long() = onnx::Gather[axis=0](%351, %350), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %353 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %354 : Long() = onnx::Constant[value={4}](), scope: SSD
  %355 : Tensor = onnx::Unsqueeze[axes=[0]](%352)
  %356 : Tensor = onnx::Unsqueeze[axes=[0]](%353)
  %357 : Tensor = onnx::Unsqueeze[axes=[0]](%354)
  %358 : Tensor = onnx::Concat[axis=0](%355, %356, %357)
  %359 : Float(1, 150, 4) = onnx::Reshape(%349, %358), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %360 : Float(1, 128, 5, 5) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%335,
%extras.1.0.weight, %extras.1.0.bias), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %361 : Float(1, 128, 5, 5) = onnx::Relu(%360), scope: SSD/Sequential/ReLU[1] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:913:0
  %362 : Float(1, 256, 3, 3) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[2, 2]](%361,
%extras.1.2.weight, %extras.1.2.bias), scope: SSD/Sequential/Conv2d[2] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %363 : Float(1, 256, 3, 3) = onnx::Relu(%362), scope: SSD/Sequential/ReLU[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:913:0
  %364 : Float(1, 18, 3, 3) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%363,
%classification_headers.3.weight, %classification_headers.3.bias), scope:
SSD/Conv2d # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/modules/conv.py:340:0
  %365 : Float(1, 3, 3, 18) = onnx::Transpose[perm=[0, 2, 3, 1]](%364), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:102:0
  %366 : Long() = onnx::Constant[value={0}](), scope: SSD
  %367 : Tensor = onnx::Shape(%365), scope: SSD
  %368 : Long() = onnx::Gather[axis=0](%367, %366), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %369 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %370 : Long() = onnx::Constant[value={3}](), scope: SSD
```

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  %371 : Tensor = onnx::Unsqueeze[axes=[0]](%368)
  %372 : Tensor = onnx::Unsqueeze[axes=[0]](%369)
  %373 : Tensor = onnx::Unsqueeze[axes=[0]](%370)
  %374 : Tensor = onnx::Concat[axis=0](%371, %372, %373)
  %375 : Float(1, 54, 3) = onnx::Reshape(%365, %374), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %376 : Float(1, 24, 3, 3) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%363,
%regression_headers.3.weight, %regression_headers.3.bias), scope: SSD/Conv2d #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %377 : Float(1, 3, 3, 24) = onnx::Transpose[perm=[0, 2, 3, 1]](%376), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:106:0
  %378 : Long() = onnx::Constant[value={0}](), scope: SSD
  %379 : Tensor = onnx::Shape(%377), scope: SSD
  %380 : Long() = onnx::Gather[axis=0](%379, %378), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %381 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %382 : Long() = onnx::Constant[value={4}](), scope: SSD
  %383 : Tensor = onnx::Unsqueeze[axes=[0]](%380)
  %384 : Tensor = onnx::Unsqueeze[axes=[0]](%381)
  %385 : Tensor = onnx::Unsqueeze[axes=[0]](%382)
  %386 : Tensor = onnx::Concat[axis=0](%383, %384, %385)
  %387 : Float(1, 54, 4) = onnx::Reshape(%377, %386), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %388 : Float(1, 128, 3, 3) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%363,
%extras.2.0.weight, %extras.2.0.bias), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %389 : Float(1, 128, 3, 3) = onnx::Relu(%388), scope: SSD/Sequential/ReLU[1] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:913:0
  %390 : Float(1, 256, 2, 2) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[2, 2]](%389,
%extras.2.2.weight, %extras.2.2.bias), scope: SSD/Sequential/Conv2d[2] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %391 : Float(1, 256, 2, 2) = onnx::Relu(%390), scope: SSD/Sequential/ReLU[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:913:0
  %392 : Float(1, 18, 2, 2) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%391,
%classification_headers.4.weight, %classification_headers.4.bias), scope:
SSD/Conv2d # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/modules/conv.py:340:0
  %393 : Float(1, 2, 2, 18) = onnx::Transpose[perm=[0, 2, 3, 1]](%392), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:102:0
  %394 : Long() = onnx::Constant[value={0}](), scope: SSD
  %395 : Tensor = onnx::Shape(%393), scope: SSD
  %396 : Long() = onnx::Gather[axis=0](%395, %394), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %397 : Long() = onnx::Constant[value={-1}](), scope: SSD
```

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  %398 : Long() = onnx::Constant[value={3}](), scope: SSD
  %399 : Tensor = onnx::Unsqueeze[axes=[0]](%396)
  %400 : Tensor = onnx::Unsqueeze[axes=[0]](%397)
  %401 : Tensor = onnx::Unsqueeze[axes=[0]](%398)
  %402 : Tensor = onnx::Concat[axis=0](%399, %400, %401)
  %403 : Float(1, 24, 3) = onnx::Reshape(%393, %402), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %404 : Float(1, 24, 2, 2) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%391,
%regression_headers.4.weight, %regression_headers.4.bias), scope: SSD/Conv2d #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %405 : Float(1, 2, 2, 24) = onnx::Transpose[perm=[0, 2, 3, 1]](%404), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:106:0
  %406 : Long() = onnx::Constant[value={0}](), scope: SSD
  %407 : Tensor = onnx::Shape(%405), scope: SSD
  %408 : Long() = onnx::Gather[axis=0](%407, %406), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %409 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %410 : Long() = onnx::Constant[value={4}](), scope: SSD
  %411 : Tensor = onnx::Unsqueeze[axes=[0]](%408)
  %412 : Tensor = onnx::Unsqueeze[axes=[0]](%409)
  %413 : Tensor = onnx::Unsqueeze[axes=[0]](%410)
  %414 : Tensor = onnx::Concat[axis=0](%411, %412, %413)
  %415 : Float(1, 24, 4) = onnx::Reshape(%405, %414), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %416 : Float(1, 128, 2, 2) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[1, 1], pads=[0, 0, 0, 0], strides=[1, 1]](%391,
%extras.3.0.weight, %extras.3.0.bias), scope: SSD/Sequential/Conv2d[0] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %417 : Float(1, 128, 2, 2) = onnx::Relu(%416), scope: SSD/Sequential/ReLU[1] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:913:0
  %418 : Float(1, 256, 1, 1) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[2, 2]](%417,
%extras.3.2.weight, %extras.3.2.bias), scope: SSD/Sequential/Conv2d[2] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %419 : Float(1, 256, 1, 1) = onnx::Relu(%418), scope: SSD/Sequential/ReLU[3] #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:913:0
  %420 : Float(1, 18, 1, 1) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%419,
%classification_headers.5.weight, %classification_headers.5.bias), scope:
SSD/Conv2d # /opt/anaconda3/lib/python3.7/site-
packages/torch/nn/modules/conv.py:340:0
  %421 : Float(1!, 1, 1!, 18) = onnx::Transpose[perm=[0, 2, 3, 1]](%420), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:102:0
  %422 : Long() = onnx::Constant[value={0}](), scope: SSD
  %423 : Tensor = onnx::Shape(%421), scope: SSD
  %424 : Long() = onnx::Gather[axis=0](%423, %422), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
```

```
  %425 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %426 : Long() = onnx::Constant[value={3}](), scope: SSD
  %427 : Tensor = onnx::Unsqueeze[axes=[0]](%424)
  %428 : Tensor = onnx::Unsqueeze[axes=[0]](%425)
  %429 : Tensor = onnx::Unsqueeze[axes=[0]](%426)
  %430 : Tensor = onnx::Concat[axis=0](%427, %428, %429)
  %431 : Float(1, 6, 3) = onnx::Reshape(%421, %430), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:103:0
  %432 : Float(1, 24, 1, 1) = onnx::Conv[dilations=[1, 1], group=1,
kernel_shape=[3, 3], pads=[1, 1, 1, 1], strides=[1, 1]](%419,
%regression_headers.5.weight, %regression_headers.5.bias), scope: SSD/Conv2d #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/modules/conv.py:340:0
  %433 : Float(1!, 1, 1!, 24) = onnx::Transpose[perm=[0, 2, 3, 1]](%432), scope:
SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:106:0
  %434 : Long() = onnx::Constant[value={0}](), scope: SSD
  %435 : Tensor = onnx::Shape(%433), scope: SSD
  %436 : Long() = onnx::Gather[axis=0](%435, %434), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %437 : Long() = onnx::Constant[value={-1}](), scope: SSD
  %438 : Long() = onnx::Constant[value={4}](), scope: SSD
  %439 : Tensor = onnx::Unsqueeze[axes=[0]](%436)
  %440 : Tensor = onnx::Unsqueeze[axes=[0]](%437)
  %441 : Tensor = onnx::Unsqueeze[axes=[0]](%438)
  %442 : Tensor = onnx::Concat[axis=0](%439, %440, %441)
  %443 : Float(1, 6, 4) = onnx::Reshape(%433, %442), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:107:0
  %444 : Float(1, 3000, 3) = onnx::Concat[axis=1](%283, %319, %347, %375, %403,
%431), scope: SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:87:0
  %445 : Float(1, 3000, 4) = onnx::Concat[axis=1](%295, %331, %359, %387, %415,
%443), scope: SSD # /home/jupyter/p4/pytorch-ssd/vision/ssd/ssd.py:88:0
  %scores : Float(1, 3000, 3) = onnx::Softmax[axis=2](%444), scope: SSD #
/opt/anaconda3/lib/python3.7/site-packages/torch/nn/functional.py:1230:0
  %447 : Float(1, 3000!, 2) = onnx::Slice[axes=[2], ends=[2], starts=[0]](%445),
scope: SSD # /home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:104:0
  %448 : Tensor = onnx::Constant[value={0.1}]()
  %449 : Tensor = onnx::Mul(%447, %448)
  %450 : Float(1, 3000!, 2) = onnx::Constant[value=<Tensor>]()
  %451 : Float(1, 3000, 2) = onnx::Mul(%449, %450), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:104:0
  %452 : Float(1, 3000!, 2) = onnx::Constant[value=<Tensor>]()
  %453 : Float(1, 3000, 2) = onnx::Add(%451, %452), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:104:0
  %454 : Float(1, 3000!, 2) = onnx::Slice[axes=[2], ends=[9223372036854775807],
starts=[2]](%445), scope: SSD # /home/jupyter/p4/pytorch-
ssd/vision/utils/box_utils.py:105:0
  %455 : Tensor = onnx::Constant[value={0.2}]()
  %456 : Tensor = onnx::Mul(%454, %455)
  %457 : Float(1, 3000, 2) = onnx::Exp(%456), scope: SSD #
```

```
/home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:105:0
  %458 : Float(1, 3000!, 2) = onnx::Constant[value=<Tensor>]()
  %459 : Float(1, 3000, 2) = onnx::Mul(%457, %458), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:105:0
  %460 : Float(1, 3000, 4) = onnx::Concat[axis=2](%453, %459), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:106:0
  %461 : Float(1, 3000!, 2) = onnx::Slice[axes=[2], ends=[2], starts=[0]](%460),
scope: SSD # /home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:208:0
  %462 : Float(1, 3000!, 2) = onnx::Slice[axes=[2], ends=[9223372036854775807],
starts=[2]](%460), scope: SSD # /home/jupyter/p4/pytorch-
ssd/vision/utils/box_utils.py:208:0
  %463 : Tensor = onnx::Constant[value={2}]()
  %464 : Tensor = onnx::Div(%462, %463)
  %465 : Float(1, 3000, 2) = onnx::Sub(%461, %464), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:208:0
  %466 : Float(1, 3000!, 2) = onnx::Slice[axes=[2], ends=[2], starts=[0]](%460),
scope: SSD # /home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:209:0
  %467 : Float(1, 3000!, 2) = onnx::Slice[axes=[2], ends=[9223372036854775807],
starts=[2]](%460), scope: SSD # /home/jupyter/p4/pytorch-
ssd/vision/utils/box_utils.py:209:0
  %468 : Tensor = onnx::Constant[value={2}]()
  %469 : Tensor = onnx::Div(%467, %468)
  %470 : Float(1, 3000, 2) = onnx::Add(%466, %469), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:209:0
  %boxes : Float(1, 3000, 4) = onnx::Concat[axis=2](%465, %470), scope: SSD #
/home/jupyter/p4/pytorch-ssd/vision/utils/box_utils.py:209:0
  return (%scores, %boxes)
```

[9]:
```
!pip install graphviz
!pip install pydot
```

```
Requirement already satisfied: graphviz in /opt/anaconda3/lib/python3.7/site-
packages (0.13.2)
Requirement already satisfied: pydot in /opt/anaconda3/lib/python3.7/site-
packages (1.4.1)
Requirement already satisfied: pyparsing>=2.1.4 in
/opt/anaconda3/lib/python3.7/site-packages (from pydot) (2.4.2)
```

[ ]:
```
model = onnx.load(model_path)
init_net, predict_net = c2.onnx_graph_to_caffe2_net(model)
print(f"Save the model in binary format to the files {init_net_path} and␣
 ↪{predict_net_path}.")

with open(init_net_path, "wb") as fopen:
    fopen.write(init_net.SerializeToString())
with open(predict_net_path, "wb") as fopen:
```

```
    fopen.write(predict_net.SerializeToString())

print(f"Save the model in txt format to the files {init_net_txt_path} and␣
 ↪{predict_net_txt_path}. ")
with open(init_net_txt_path, 'w') as f:
    f.write(str(init_net))

with open(predict_net_txt_path, 'w') as f:
    f.write(str(predict_net))
```

[ ]: