

Problem 3:

Preliminaries: MobileNet evaluations:

```
process image 4950
Load Image: 0.003721 seconds.
Inference time: 0.00545954704284668
Prediction: 0.029694 seconds.
process image 4951
Load Image: 0.004094 seconds.
Inference time: 0.005414009094238281
Prediction: 0.034233 seconds.
```

```
Average Precision Per-class:
aeroplane: 0.6843271224059599
bicycle: 0.7911140237662206
bird: 0.6171819168583986
boat: 0.5612220055063379
bottle: 0.3485216621466003
bus: 0.7677814849265677
car: 0.7280986468467315
cat: 0.8369208203985581
chair: 0.5169138632991064
cow: 0.6238697603075337
diningtable: 0.7062172972736019
dog: 0.7872656014540705
horse: 0.819446325939355
motorbike: 0.7918539457195842
person: 0.702363739134837
pottedplant: 0.3985294933564374
sheep: 0.6066678298227772
sofa: 0.7573083661544429
train: 0.8262441264750008
tvmonitor: 0.6461898726506375
```

```
Average Precision Across All Classes:0.6759018952221378
jupyter@pytorch-20191128-090239:~/p4/pytorch-ssd$ █
```

1. Gun model accuracy prior to pretraining:

```
Prediction: 0.019779 seconds.  
process image 113  
Load Image: 0.013086 seconds.  
Inference time: 0.005430698394775391  
Prediction: 0.022696 seconds.  
process image 114  
Load Image: 0.005801 seconds.  
Inference time: 0.005502223968505859  
Prediction: 0.021137 seconds.  
process image 115  
Load Image: 0.030274 seconds.  
Inference time: 0.006104946136474609  
Prediction: 0.026075 seconds.  
process image 116  
Load Image: 0.018318 seconds.  
Inference time: 0.0055544376373291016  
Prediction: 0.023445 seconds.  
process image 117  
Load Image: 0.017751 seconds.  
Inference time: 0.005439281463623047  
Prediction: 0.022205 seconds.  
process image 118  
Load Image: 0.017205 seconds.  
Inference time: 0.005541801452636719  
Prediction: 0.025228 seconds.  
process image 119  
Load Image: 0.007807 seconds.  
Inference time: 0.0054476261138916016  
Prediction: 0.023720 seconds.  
process image 120  
Load Image: 0.028009 seconds.  
Inference time: 0.005576133728027344  
Prediction: 0.025029 seconds.  
process image 121  
Load Image: 0.030677 seconds.  
Inference time: 0.005472660064697266  
Prediction: 0.024812 seconds.  
process image 122  
Load Image: 0.016972 seconds.  
Inference time: 0.005519866943359375  
Prediction: 0.029891 seconds.
```

Average Precision Per-class:

Handgun: 0.717264083289075

Shotgun: 0.36675558549231463

Post Retraining / FineTuning:

```
process image 115
Load Image: 0.029430 seconds.
Inference time: 0.006186008453369141
Prediction: 0.017304 seconds.
process image 116
Load Image: 0.017097 seconds.
Inference time: 0.005478858947753906
Prediction: 0.009660 seconds.
process image 117
Load Image: 0.016660 seconds.
Inference time: 0.00549626350402832
Prediction: 0.010582 seconds.
process image 118
Load Image: 0.016109 seconds.
Inference time: 0.005824089050292969
Prediction: 0.012262 seconds.
process image 119
Load Image: 0.006765 seconds.
Inference time: 0.0054743289947509766
Prediction: 0.010021 seconds.
process image 120
Load Image: 0.028801 seconds.
Inference time: 0.0063703060150146484
Prediction: 0.025303 seconds.
process image 121
Load Image: 0.028208 seconds.
Inference time: 0.0054454803466796875
Prediction: 0.016055 seconds.
process image 122
Load Image: 0.015232 seconds.
Inference time: 0.005385637283325195
Prediction: 0.011445 seconds.
```

Average Precision Per-class:

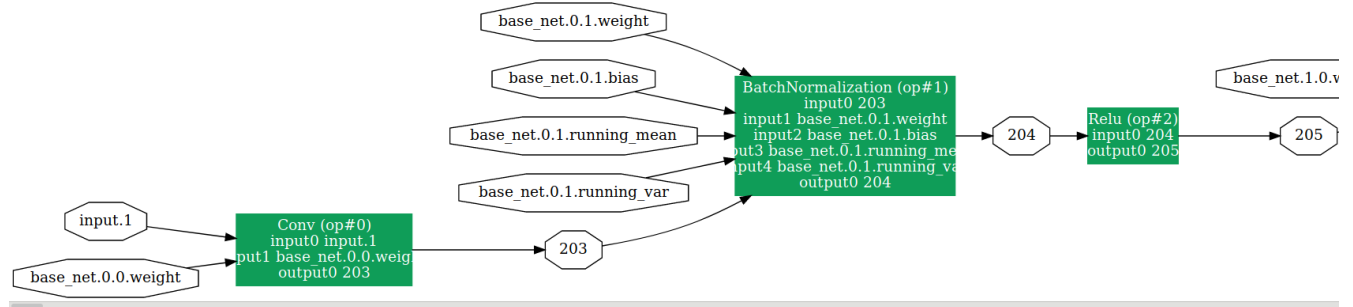
Handgun: 0.8358746170703227

Shotgun: 0.5202483365724209

Average Precision Across All Classes:0.6780614768213717

jupyter@pytorch-20191128-090239:~/p4/pytorch-ssd\$ █

3. Sample Visualization:



4. Onnx server running:

```
(dl) shivgehiv-HP-Pavilion-Notebook:~/dl$ sudo docker run -it -v $(pwd):$(pwd) -p 9001:8001 mcr.microsoft.com/onnxruntime/server --model_path $(pwd)/mb1-ssd-gun.onnx
Version: local build
Commit ID: default
[2019-12-15 05:36:06.312] [ServerApp] [Info] Model path: /home/shiv/dl/mb1-ssd-gun.onnx
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.4.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.3.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.2.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.4.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.5.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.3.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.10.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.1.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.10.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.13.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.8.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.1.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.2.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.4.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.8.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.0.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.11.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.12.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.359] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.11.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.360] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.5.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.360] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.9.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.360] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.6.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.360] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.7.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.360] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.6.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.360] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.7.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.360] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.13.1.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.360] [ServerApp] [warning] [ServerApp onnxruntime graph.cc:2367 CleanUnusedInitializers]: Removing initializer 'base_net.9.4.num batches tracked'. It is not used by any node and should be removed from the model.
[2019-12-15 05:36:06.360] [ServerApp] [Info] [onnxruntime inference session.cc:545 Initialize]: Initializing session.
[2019-12-15 05:36:06.360] [ServerApp] [Info] [onnxruntime inference session.cc:559 Initialize]: Adding default CPU execution provider.
[2019-12-15 05:36:06.360] [ServerApp] [Info] [ServerApp onnxruntime bfc_arena.cc:25 BFCArena]: Creating bin of max chunk size 256
[2019-12-15 05:36:06.360] [ServerApp] [Info] [ServerApp onnxruntime bfc_arena.cc:25 BFCArena]: Creating bin of max chunk size 512
[2019-12-15 05:36:06.360] [ServerApp] [Info] [ServerApp onnxruntime bfc_arena.cc:25 BFCArena]: Creating bin of max chunk size 1024
[2019-12-15 05:36:06.360] [ServerApp] [Info] [ServerApp onnxruntime bfc_arena.cc:25 BFCArena]: Creating bin of max chunk size 2048
[2019-12-15 05:36:06.360] [ServerApp] [Info] [ServerApp onnxruntime bfc_arena.cc:25 BFCArena]: Creating bin of max chunk size 4096
[2019-12-15 05:36:06.360] [ServerApp] [Info] [ServerApp onnxruntime bfc_arena.cc:25 BFCArena]: Creating bin of max chunk size 8192
[2019-12-15 05:36:06.360] [ServerApp] [Info] [ServerApp onnxruntime bfc_arena.cc:25 BFCArena]: Creating bin of max chunk size 16384
[2019-12-15 05:36:06.360] [ServerApp] [Info] [ServerApp onnxruntime bfc_arena.cc:25 BFCArena]: Creating bin of max chunk size 32768
```

