

Eddie Christopher Fox III

Student ID: 1155160788

March 21, 2022

Lab 3 Report

Deliverable #1: Dockerfile (container image manifest) for YOLO darknet program

```
s1155160788@user-desktop: ~/docker-yolov4-cuda
GNU nano 2.9.3 Dockerfile

FROM nvidia/cuda:11.5.1-cudnn8-devel-ubuntu18.04

ENV TZ=Asia/Taipei
RUN ln -snf /usr/share/zoneinfo/$TZ /etc/localtime && echo $TZ > /etc/timezone

RUN apt update
RUN apt install -y python3-opencv \
    libopencv-dev \
    wget \
    git \
    build-essential

RUN git clone --depth=1 https://github.com/AlexeyAB/darknet

WORKDIR darknet

RUN wget -c -N https://github.com/AlexeyAB/darknet/releases/download/darknet_yolo_v3_optimal/yolov4.weights -O /opt/yolov4.weights
RUN wget -c -N https://raw.githubusercontent.com/AlexeyAB/darknet/master/cfg/yolov4.cfg -O /opt/yolov4.cfg

RUN mkdir /opt/videos
COPY traffic.mp4 /opt/videos/traffic.mp4

EXPOSE 8070
EXPOSE 8090

RUN make -j6 GPU=0 OPENCV=1 CUDNN=0 CUDNN_HALF=0

CMD ./darknet detector demo ./cfg/coco.data ./cfg/yolov4-custom.cfg /opt/yolov4.weights /opt/videos/traffic.mp4 -json_port 8070 -mjpeg_port 8090 -ext_output -dont_show

#EOF
```

Screenshot of Dockerfile here, will also upload with Blackboard submission).

Output from running:

```
161 Demo
mini_batch = 1, batch = 16, time_steps = 1, train = 0
nms_kind: greedy_nms (1), beta = 0.600000
nms_kind: greedy_nms (1), beta = 0.600000
nms_kind: greedy_nms (1), beta = 0.600000
yolo
[yolo] params: iou loss: ciou (4), iou_norm: 0.07, obj_norm: 1.00, cls_norm: 1.00, delta_norm: 1.00, scale_x_y: 1.10
151 route 147 -> 38 x 38 x 256
152 conv 512 3 x 3/ 2 38 x 38 x 256 -> 19 x 19 x 512 0.852 BF
153 route 152 116 -> 19 x 19 x1024
154 conv 512 1 x 1/ 1 19 x 19 x1024 -> 19 x 19 x 512 0.379 BF
155 conv 1024 3 x 3/ 1 19 x 19 x 512 -> 19 x 19 x1024 3.407 BF
156 conv 512 1 x 1/ 1 19 x 19 x1024 -> 19 x 19 x 512 0.379 BF
157 conv 1024 3 x 3/ 1 19 x 19 x 512 -> 19 x 19 x1024 3.407 BF
158 conv 512 1 x 1/ 1 19 x 19 x1024 -> 19 x 19 x 512 0.379 BF
159 conv 1024 3 x 3/ 1 19 x 19 x 512 -> 19 x 19 x1024 3.407 BF
160 conv 255 1 x 1/ 1 19 x 19 x1024 -> 19 x 19 x 255 0.189 BF
[yolo] params: iou loss: ciou (4), iou_norm: 0.07, obj_norm: 1.00, cls_norm: 1.00, delta_norm: 1.00, scale_x_y: 1.05
Total BFLOPS 128.459
avg_outputs = 1068395
Loading weights from /opt/yolov4.weights...Done! Loaded 162 layers from weights-file
```

seen 64, trained: 32032 K-images (500 Kilo-batches_64)

video file: /opt/videos/traffic.mp4

Video stream: 1280 x 720

Objects:

JSON-stream sent.

FPS:0.0 AVG_FPS:0.0

Objects:

JSON-stream sent.

car: 100%	(left_x: 211	top_y: 289	width: 100	height: 90)
car: 99%	(left_x: 559	top_y: 196	width: 66	height: 76)
car: 99%	(left_x: 590	top_y: 289	width: 86	height: 115)
car: 98%	(left_x: 398	top_y: 154	width: 54	height: 57)
car: 98%	(left_x: 354	top_y: 78	width: 39	height: 39)
car: 96%	(left_x: 364	top_y: 25	width: 30	height: 23)
car: 91%	(left_x: 284	top_y: 80	width: 42	height: 40)
car: 85%	(left_x: 399	top_y: 5	width: 23	height: 20)
person: 53%	(left_x: 260	top_y: 93	width: 23	height: 46)

FPS:0.0 AVG_FPS:0.0

MJPEG-stream sent.

Objects:

JSON-stream sent.

car: 99%	(left_x: 591	top_y: 290	width: 85	height: 115)
car: 99%	(left_x: 559	top_y: 196	width: 68	height: 78)
car: 99%	(left_x: 203	top_y: 296	width: 108	height: 96)
car: 99%	(left_x: 396	top_y: 155	width: 55	height: 61)
car: 98%	(left_x: 354	top_y: 79	width: 39	height: 40)
car: 91%	(left_x: 365	top_y: 27	width: 29	height: 22)
car: 90%	(left_x: 284	top_y: 80	width: 42	height: 40)
car: 79%	(left_x: 399	top_y: 5	width: 23	height: 20)
person: 49%	(left_x: 260	top_y: 93	width: 23	height: 46)

FPS:0.0 AVG_FPS:0.0

MJPEG-stream sent.

Objects:

```

{"frame_id":8,
"objects": [
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.175694, "center_y":0.542186, "width":0.092175, "height":0.153822, "confidence":0.993871},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.497222, "center_y":0.494386, "width":0.067359, "height":0.162991, "confidence":0.990542},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.328834, "center_y":0.285038, "width":0.045199, "height":0.098473, "confidence":0.988987},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.466365, "center_y":0.333850, "width":0.048983, "height":0.112677, "confidence":0.988071},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.291120, "center_y":0.155907, "width":0.035131, "height":0.060508, "confidence":0.969718},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.297212, "center_y":0.061378, "width":0.022127, "height":0.034478, "confidence":0.949011},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.238760, "center_y":0.139748, "width":0.033045, "height":0.054524, "confidence":0.932837},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.322374, "center_y":0.028774, "width":0.016574, "height":0.025332, "confidence":0.830748},
{"class_id":0, "name":"person", "relative_coordinates":{"center_x":0.212967, "center_y":0.161825, "width":0.018511, "height":0.062317, "confidence":0.538715}
]
},
{"frame_id":9,
"objects": [
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.170068, "center_y":0.557448, "width":0.092298, "height":0.155876, "confidence":0.994558},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.466675, "center_y":0.336062, "width":0.049181, "height":0.112580, "confidence":0.988290},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.327966, "center_y":0.292045, "width":0.044340, "height":0.091840, "confidence":0.984054},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.497380, "center_y":0.495836, "width":0.066823, "height":0.161687, "confidence":0.983619},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.291939, "center_y":0.160794, "width":0.031176, "height":0.059459, "confidence":0.958087},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.297064, "center_y":0.062830, "width":0.023812, "height":0.036281, "confidence":0.955108},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.238719, "center_y":0.139742, "width":0.033182, "height":0.054559, "confidence":0.926202},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.322567, "center_y":0.029014, "width":0.017131, "height":0.025266, "confidence":0.888124},
{"class_id":0, "name":"person", "relative_coordinates":{"center_x":0.213029, "center_y":0.161722, "width":0.018492, "height":0.062135, "confidence":0.511994}
]
},
{"frame_id":10,
"objects": [
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.163391, "center_y":0.571885, "width":0.099500, "height":0.164362, "confidence":0.994332},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.466769, "center_y":0.338825, "width":0.049197, "height":0.111184, "confidence":0.991436},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.327468, "center_y":0.298587, "width":0.045156, "height":0.094172, "confidence":0.991225},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.498974, "center_y":0.498755, "width":0.064698, "height":0.169701, "confidence":0.974251},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.296485, "center_y":0.063875, "width":0.023214, "height":0.036227, "confidence":0.959355},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.290858, "center_y":0.162797, "width":0.032986, "height":0.062107, "confidence":0.952814},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.238803, "center_y":0.139409, "width":0.032792, "height":0.055141, "confidence":0.925386},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.322682, "center_y":0.029762, "width":0.016912, "height":0.025824, "confidence":0.923840},
{"class_id":0, "name":"person", "relative_coordinates":{"center_x":0.213087, "center_y":0.161903, "width":0.018345, "height":0.062228, "confidence":0.376389}
]
},
{"frame_id":11,
"objects": [
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.156523, "center_y":0.588545, "width":0.103790, "height":0.165146, "confidence":0.993598},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.467016, "center_y":0.339715, "width":0.048370, "height":0.111592, "confidence":0.986272},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.498568, "center_y":0.501271, "width":0.064765, "height":0.169914, "confidence":0.975759},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.326518, "center_y":0.387927, "width":0.046638, "height":0.084907, "confidence":0.968504},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.290924, "center_y":0.160995, "width":0.033544, "height":0.063309, "confidence":0.948094},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.297141, "center_y":0.067286, "width":0.023389, "height":0.034623, "confidence":0.926927},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.322626, "center_y":0.030127, "width":0.017312, "height":0.028118, "confidence":0.925360},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.238932, "center_y":0.139276, "width":0.033228, "height":0.056495, "confidence":0.922778},
{"class_id":2, "name":"car", "relative_coordinates":{"center_x":0.327912, "center_y":0.278425, "width":0.042842, "height":0.045957, "confidence":0.338573},
{"class_id":0, "name":"person", "relative_coordinates":{"center_x":0.212833, "center_y":0.162147, "width":0.017779, "height":0.061546, "confidence":0.484428}
]
}

```

Unable to view the VLC media player output because the CPU version of this runs at 0 FPS.

Deliverable #2: Dockerhub repo link for the uploaded container image, and screenshot of the repo.

```
s1155160788@user-desktop:~/docker-yolov4-cuda$ sudo docker tag docker-yolo-cuda-cudnn:vl.0-s1155160788-CPU eddiecfox/docker-yolo-cuda-cudnn:vl.0-yolo-cpu
s1155160788@user-desktop:~/docker-yolov4-cuda$ sudo docker image ls
REPOSITORY          TAG                IMAGE ID           CREATED            SIZE
docker-yolo-cuda-cudnn    vl.0-s1155160788-GPU    4e92e76011c7      37 minutes ago    7.81GB
eddiecfox/docker-yolo-cuda-cudnn    vl.0-yolo-cpu          7fea7ff2e10f      43 minutes ago    7.8GB
docker-yolo-cuda-cudnn    vl.0-s1155160788-CPU    7fea7ff2e10f      43 minutes ago    7.8GB
nvr.cr.io/nvidia/deepstream    6.0.1-base           9c1b495eff1e      4 weeks ago       6.56GB
nvidia/cuda                  11.5.1-cudnn8-devel-ubuntu18.04    9a40e2f4aa5f      2 months ago      6.68GB
nvr.cr.io/nvidia/deepstream-14t    6.0-samples          1e08ebd4f227      5 months ago      1.78GB
s1155160788@user-desktop:~/docker-yolov4-cuda$ sudo docker push eddiecfox/docker-yolo-cuda-cudnn:vl.0-yolo-cpu
The push refers to repository [docker.io/eddiecfox/docker-yolo-cuda-cudnn]
49b95ab3f6fd: Pushed
f835e4f65484: Pushed
5e4ff2cf6055: Pushed
4d40dflcd353b: Pushed
4be49d084359: Pushed
086a58cae440: Pushed
f7ee904e5ea6: Pushed
34a85ad77b91: Pushed
f02947fe83ca: Pushed
d581666af08f: Mounted from nvidia/cuda
2e99cd0b264c: Mounted from nvidia/cuda
de37ab319d17: Mounted from nvidia/cuda
423e2ea8ffc6: Mounted from nvidia/cuda
cd0481f0a756: Mounted from nvidia/cuda
c2108e26e588: Mounted from nvidia/cuda
39e96cf8dde0: Mounted from nvidia/cuda
4da45304f72d: Mounted from nvidia/cuda
17f9cb56818d: Mounted from nvidia/cuda
49c23cd3c582: Mounted from nvidia/cuda
vl.0-yolo-cpu: digest: sha256:46cea2f1194296c6312eec3b883a03d066c8b7435979f3ee75ef73dcf65a19b5 size: 4320
s1155160788@user-desktop:~/docker-yolov4-cuda$
```

Link to repository: <https://hub.docker.com/r/eddiecfox/docker-yolo-cuda-cudnn>

Note: This is my repo, as can be seen by the username being eddiecfox and my actual name being Eddie Christopher Fox. I just wanted to create a docker username I could actually use in the future, instead of s1155160788.

eddiecfox/docker-yolo-cuda-cudnn ☆

By eddiecfox • Updated 7 minutes ago

docker-yolo-cuda-cudnn

Container

Overview Tags

No overview available

This repository doesn't have an overview

Docker Pull Command

```
docker pull eddiecfox/docker-yolo-cuda-cudnn
```

Advanced Image Management

View all your images and tags in this repository, clean up unused content, recover untagged images. Available with Pro, Team and Business subscriptions. [View preview](#)

Sort by: Newest

Filter Tags

TAG	DIGEST	OS/ARCH	LAST PULL	COMPRESSED SIZE
v1.0-yolo-cpu	46cea2f11942	linux/arm64	---	3.92 GB

Deliverable #3: Container image for the built container. You can upload to Google Drive or any other shareable link.

```
s1155160788@user-desktop:~/docker-yolov4-cuda$ sudo docker save docker-yolo-cuda-cudnn:v1.0-s1155160788-CPU > docker-yolo-cuda-cudnn_v1.0-s1155160788.tar
s1155160788@user-desktop:~/docker-yolov4-cuda$
s1155160788@user-desktop:~/docker-yolov4-cuda$ ls
Dockerfile Dockerfile-GPU docker-yolo-cuda-cudnn_v1.0-s1155160788.tar traffic.mp4
s1155160788@user-desktop:~/docker-yolov4-cuda$ ls -al
total 7714124
drwxrwxr-x 2 s1155160788 s1155160788 4096 Mar 20 10:24 .
drwxr-xr-x 11 s1155160788 s1155160788 4096 Mar 20 09:51 ..
-rw-rw-r-- 1 s1155160788 s1155160788 881 Mar 20 09:08 Dockerfile
-rw-rw-r-- 1 s1155160788 s1155160788 880 Mar 20 09:10 Dockerfile-GPU
-rw-rw-r-- 1 s1155160788 s1155160788 7826055680 Mar 20 10:33 docker-yolo-cuda-cudnn_v1.0-s1155160788.tar
-rw-r--r-- 1 s1155160788 s1155160788 73179477 Mar 19 16:17 traffic.mp4
s1155160788@user-desktop:~/docker-yolov4-cuda$
```

I used the docker save command to save it to a tar file as instructed in Step 5: Export the container image.

Afterwards, I used the gdrive tool at this [link](#) to upload it to Google Drive.

Link on next page.

Final shareable link:

https://drive.google.com/file/d/11zFv8t88UGa_bRdu7cOp_ux0ZyiHzJNr/view?usp=sharing