

## Pengamatan dan Pengujian Terhadap Objek Daging Babi dan Daging Sapi



## ***CURRICULUM VITAE***

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### RIWAYAT PENDIDIKAN FORMAL

PENDIDIKAN	NAMA SEKOLAH	TAMAT TAHUN
SD	SD PATRA MANDIRI 2 PALEMBANG	2012
SMP	SMP IT IZZUDDIN PALEMBANG	2015
SMA	SMA IT IZZUDDIN PALEMBANG	2018

### PENGALAMAN PENELITIAN

NO	NAMA PENELITIAN	TAHUN
1	IMPLEMENTASI METODE YOLO DALAM KLASIFIKASI DAGING SAPI DAN DAGING BABI DI PASAR TRADISIONAL	2023

### PENGALAMAN ORGANISASI

NO	PENGALAMAN ORGANISASI	TAHUN
1	ANGGOTA SEKSI OLAHRAGA OSIS SMP IT IZZUDDIN PALEMBANG	2013-2014
2	KETUA SEKSI OLAHRAGA OSIS SMA IT IZZUDDIN PALEMBANG	2016-2017
3	ANGGOTA DIVISI KEKARYAAN HMJ TEKNIK ELEKTRO POLITEKNIK NEGERI SRIWIJAYA	2019-2022

Semua data yang saya isikan dan tercantum dalam *curriculum vitae* ini adalah benar dan dapat dipertanggungjawabkan.

**Palembang, Agustus 2023**

**(HAFIZH ULWAN)**

## Pengamatan dan Pengujian Terhadap Objek Daging Babi dan Daging Sapi



```
#mount drive
%cd ..
from google.colab import drive
drive.mount('/content/gdrive')

# this creates a symbolic link so that now the path
/content/gdrive/My\ Drive/ is equal to /mydrive
!ln -s /content/gdrive/My\ Drive/ /mydrive

# list contents in yolov4-tiny folder in your drive
!ls /mydrive/yolov4-tiny

# change makefile to have GPU and OPENCV enabled
# also set CUDNN, CUDNN_HALF and LIBSO to 1

%cd /content/darknet/
!sed -i 's/OPENCV=0/OPENCV=1/' Makefile
!sed -i 's/GPU=0/GPU=1/' Makefile
!sed -i 's/CUDNN=0/CUDNN=1/' Makefile
!sed -i 's/CUDNN_HALF=0/CUDNN_HALF=1/' Makefile
!sed -i 's/LIBSO=0/LIBSO=1/' Makefile

# build darknet
!make

# Clean the data and cfg folders first except the labels folder
in data which is required

%cd data/
!find -maxdepth 1 -type f -exec rm -rf {} \;
%cd ..

%rm -rf cfg/
%mkdir cfg
#copy the datasets zip file to the root darknet folder
!cp /mydrive/yolov4-tiny/obj.zip ../

# unzip the datasets and their contents so that they are now in
/darknet/data/ folder
!unzip ../obj.zip -d data/
#copy the custom cfg file from the drive to the darknet/cfg
folder
!cp /mydrive/yolov4-tiny/yolov4-tiny-custom.cfg ./cfg
```

```

# copy the obj.names and obj.data files so that they are now in
/darknet/data/ folder
!cp /mydrive/yolov4-tiny/obj.names ./data
!cp /mydrive/yolov4-tiny/obj.data ./data
#copy the process.py file from the drive to the darknet directory
!cp /mydrive/yolov4-tiny/process.py ./
# run process.py ( this creates the train.txt and test.txt files
in our darknet/data folder )
!python process.py

# list the contents of data folder to check if the train.txt and
test.txt files have been created
!ls data/
# Download the yolov4-tiny pre-trained weights file
!wget
https://github.com/AlexeyAB/darknet/releases/download/darknet_
yolo_v4_pre/yolov4-tiny.conv.29
# define helper function imShow
def imShow(path):
    import cv2
    import matplotlib.pyplot as plt
    %matplotlib inline

    image = cv2.imread(path)
    height, width = image.shape[:2]
    resized_image = cv2.resize(image, (3*width, 3*height),
interpolation = cv2.INTER_CUBIC)

    fig = plt.gcf()
    fig.set_size_inches(18, 10)
    plt.axis("off")
    plt.imshow(cv2.cvtColor(resized_image, cv2.COLOR_BGR2RGB))
    #plt.show('')
#only works if the training does not get interrupted
imShow('chart.png')
#You can check the mAP for all the saved weights to see which
gives the best results ( xxxx here is the saved weight number
like 4000, 5000 or 6000 snd so on )

!./darknet detector map data/obj.data cfg/yolov4-tiny-
custom.cfg /mydrive/yolov4-tiny/training/yolov4-tiny-
custom_best.weights -points 0

```

Colab interface for 'yolov4-custom\_TRAINING.ipynb'. The code cell contains the following commands:

```

#mount drive
%cd ..
from google.colab import drive
drive.mount('/content/gdrive')

# this creates a symbolic link so that now the path /content/gdrive/My Drive/ is equal to /mydrive
!ln -s /content/gdrive/My Drive/ /mydrive

# list the contents of /mydrive
!ls /mydrive

#Navigate to /mydrive/yolov4
%cd /mydrive/yolov4
  
```

The terminal output shows:

```

/content/gdrive/MyDrive
Drive already mounted at /content/gdrive; to attempt to forcibly remount, call drive.mount("/content/gdrive")
ln: failed to create symbolic link '/mydrive/My Drive': File exists
'colab Notebooks' 'My Drive' yolov4
/content/gdrive/My Drive/yolov4
  
```

Colab interface for 'yolov4-custom\_TRAINING.ipynb'. The code cell contains the following commands:

```

# change makefile to have GPU and OPENCV enabled
# also set CUDNN, CUDNN_HALF and LIBSO to 1

%cd darknet/
!sed -i 's/OPENCV=0/OPENCV=1/' Makefile
!sed -i 's/GPU=0/GPU=1/' Makefile
!sed -i 's/CUDNN=0/CUDNN=1/' Makefile
!sed -i 's/CUDNN_HALF=0/CUDNN_HALF=1/' Makefile
!sed -i 's/LIBSO=0/LIBSO=1/' Makefile
  
```

The terminal output shows:

```

/content/gdrive/My Drive/yolov4/darknet
  
```

Browser tabs and address bar showing the Google Drive link: [colab.research.google.com/drive/1y3lq59mOX1ealZiGdorJR-78Q8\\_d8AR#scrollTo=lkvlpYU3vkW](https://colab.research.google.com/drive/1y3lq59mOX1ealZiGdorJR-78Q8_d8AR#scrollTo=lkvlpYU3vkW)

Colab interface for 'Salinan dari yolov4-custom\_TRAINING.ipynb'. The code cell contains the following output:

```

nms_kind: greedy_nms (1), beta = 0.600000
Total BFLOPS 59.570
avg_outputs = 489910
Allocate additional workspace_size = 134.22 MB
Loading weights from /mydrive/yolov4/training/yolov4-custom_last.weights...
seen 64, trained: 57 K-images (0 Kilo-batches_64)
Done! Loaded 162 layers from weights-file

calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
2
detections_count = 3, unique_truth_count = 2
class_id = 0, name = daging_sapi, ap = 0.00% (TP = 0, FP = 1)
class_id = 1, name = daging_babi, ap = 100.00% (TP = 1, FP = 0)

for conf_thresh = 0.25, precision = 0.50, recall = 0.50, F1-score = 0.50
for conf_thresh = 0.25, TP = 1, FP = 1, FN = 1, average IoU = 30.14 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.500000, or 50.00 %
Total Detection Time: 1 Seconds

Set -points flag:
--points 101 for MS COCO
  
```

The file browser on the left shows the directory structure:

- gdrive
  - MyDrive
    - Colab Notebooks
    - My Drive
      - Colab Notebooks
      - My Drive
      - yolov4
        - darknet
        - training
          - yolov4-custom\_last.weights
          - obj.data
          - obj.names
          - obj.zip
          - process.py
          - yolov4-custom.cfg

The terminal output includes a section titled "12) Test your custom Object Detector".

System tray and taskbar showing a Windows taskbar with various icons and a system tray with the date 05/08/2023 and time 09:01.



Train a custom YOLOv4 detector | Drive Saya - Google Drive | TRAIN A CUSTOM YOLOv4-tiny | yolov4-tiny-custom\_TRAINING.ipynb

colab.research.google.com/drive/1hQO4nOoD6RDxzb3C1YSiiTsyZjZpYm?usp=sharing#scrollTo=IkVfpYU3vK-W

File Edit Lihat Sisipkan Runtime Fitur Bantuan Tidak dapat menyimpan perubahan

File Explorer: darknet, gdrive, MyDrive, Colab Notebooks, My Drive, yolov4-tiny, sample\_data, obj.zip

```

37 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: 1.05
nms_kind: greedy (1), beta = 0.600000
Total BFLOPS 6.789
avg_outputs = 299797
Allocate additional workspace_size = 134.22 MB
Loading weights from /mydrive/yolov4-tiny/training/yolov4-tiny-custom_best.weights...
seen 64, trained: 236 K-images (3 Kilo-batches_64)
Done! Loaded 38 layers from weights-file

calculation mAP (mean average precision)...
Detection layer: 30 - type = 28
Detection layer: 37 - type = 28
152
detections_count = 768, unique_truth_count = 224
class_id = 0, name = daging_sapi, ap = 95.24% (TP = 161, FP = 31)
class_id = 1, name = daging_babi, ap = 96.89% (TP = 50, FP = 8)

for conf_thresh = 0.25, precision = 0.84, recall = 0.94, F1-score = 0.89
for conf_thresh = 0.25, TP = 211, FP = 39, FN = 13, average IoU = 66.82 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.960632, or 96.06 %
Total Detection Time: 2 Seconds

Set -points flag:
'-points 101' for MS COCO
'-points 11' for PascalVOC 2007 (uncomment 'difficult' in voc.data)
'-points 0' (AUC) for ImageNet, PascalVOC 2010-2012, your custom dataset
  
```

Disk 141.73 GB tersedia

3 d selesai pada 11.01

Train a custom YOLOv4 detector | Drive Saya - Google Drive | TRAIN A CUSTOM YOLOv4-tiny | yolov4-tiny-custom\_TRAINING.ipynb

colab.research.google.com/drive/1hQO4nOoD6RDxzb3C1YSiiTsyZjZpYm?usp=sharing#scrollTo=IkVfpYU3vK-W

File Edit Lihat Sisipkan Runtime Fitur Bantuan Tidak dapat menyimpan perubahan

File Explorer: darknet, gdrive, MyDrive, Colab Notebooks, My Drive, yolov4-tiny, sample\_data, obj.zip

Disk 141.73 GB tersedia

3 d selesai pada 11.01

+ Kode + Teks Salin ke Drive

T4 RAM besar Disk

```
# build darknet
make

chmod +x *.sh
g++ -std=c++11 -std=c++11 -Iinclude/ -I3rdparty/stb/include -DOPENCV `pkg-config --cflags opencv4 2> /dev/null || pkg-config --cflags opencv` ./src/image_opencv.cpp: In function 'void draw_detections_cv_v3(void**, detection*, int, float, char**, image**, int, int)':
./src/image_opencv.cpp:946:23: warning: variable 'rgb' set but not used [-Wunused-but-set-variable]
   946 |         float rgb[3];
       |         ~~~~~
./src/image_opencv.cpp: In function 'void draw_train_loss(char*, void**, int, float, float, int, int, float, int, char*, float, float)':
./src/image_opencv.cpp:1147:13: warning: this 'if' clause does not guard... [-Wmisleading-indentation]
  1147 |         if (iteration_old == 0)
       |         ~~~~~
./src/image_opencv.cpp:1150:17: note: ...this statement, but the latter is misleadingly indented as if it were guarded by the 'if'
  1150 |         if (iteration_old != 0){
       |         ~~~~~
./src/image_opencv.cpp: In function 'void cv_draw_object(image, float*, int, int, int*, float*, int*, int, char**)':
./src/image_opencv.cpp:1444:14: warning: unused variable 'buff' [-Wunused-variable]
  1444 |         char buff[100];
       |         ~~~~~
./src/image_opencv.cpp:1420:9: warning: unused variable 'it_tb_res' [-Wunused-variable]
  1420 |         int it_tb_res = cv::createTrackbar(it_trackbar_name, window_name, &it_trackbar_value, 1000);
       |         ~~~~~
./src/image_opencv.cpp:1424:9: warning: unused variable 'lr_tb_res' [-Wunused-variable]
  1424 |         int lr_tb_res = cv::createTrackbar(lr_trackbar_name, window_name, &lr_trackbar_value, 20);
       |         ~~~~~
./src/image_opencv.cpp:1428:9: warning: unused variable 'cl_tb_res' [-Wunused-variable]
  1428 |         int cl_tb_res = cv::createTrackbar(cl_trackbar_name, window_name, &cl_trackbar_value, classes-1);
       |         ~~~~~
./src/image_opencv.cpp:1431:9: warning: unused variable 'bo_tb_res' [-Wunused-variable]
```

Cuplikan kode Terminal X

```
/content#
/content# 0;276;0c
```

```
[ ] # Clean the data and cfg folders first except the labels folder in data which is required
%cd data/
!find -maxdepth 1 -type f -exec rm -rf {} \;
%cd ..

%rm -rf cfg/
%mkdir cfg
```

Cuplikan kode Terminal X

```
/content#
/content# 0;276;0c
```

```
[ ] # Unzip the obj.zip dataset and its contents so that they are now in /darknet/data/ folder

!unzip /mydrive/yolov4/obj.zip -d data/
```

```
[ ] # Copy the yolov4-custom.cfg file so that it is now in /darknet/cfg/ folder

!cp /mydrive/yolov4/yolov4-custom.cfg cfg

# verify if your custom file is in cfg folder
!ls cfg/
```

```
[ ] # Copy the obj.names and obj.data files from your drive so that they are now in /darknet/data/ folder

!cp /mydrive/yolov4/obj.names data
!cp /mydrive/yolov4/obj.data data
```

Cuplikan kode Terminal X

```
/content#
/content# 0;276;0c
```

```
# Clean the data and cfg folders first except the labels folder in data which is required
%cd data/
!find -maxdepth 1 -type f -exec rm -rf {} \;
%cd ..

%rm -rf cfg/
%mkdir cfg
```

```
📁 /content/gdrive/MyDrive/yolov4/darknet/data
📁 /content/gdrive/MyDrive/yolov4/darknet
```



darknet training colab - Pe... x TRAIN A CUSTOM YOLOv4 x yolov4-custom\_TRAINING... x Halaman Tidak Ditemukan x yolov4 - Google Drive x yolov4 - Google Drive x +

colab.research.google.com/drive/1zqRb08jHvIMR4lgAXeNy1kUjDU85B7usp=sharing#scrollTo=R\_4kviylurEF

yolov4-custom\_TRAINING.ipynb

File Edit Lihat Sisipkan Runtime Fitur Bantuan Tidak dapat menyimpan perubahan

+ Kode + Teks Salin ke Drive

```
# Copy the yolov4-custom.cfg file so that it is now in /darknet/cfg/ folder
!cp /mydrive/yolov4/yolov4-custom.cfg cfg

# verify if your custom file is in cfg folder
!ls cfg/

yolov4-custom.cfg

# Copy the obj.names and obj.data files from your drive so that they are now in /darknet/data/ folder

!cp /mydrive/yolov4/obj.names data
!cp /mydrive/yolov4/obj.data data

# verify if the above files are in data folder
!ls data/

[ ] # Copy the process.py file to the current darknet directory

!cp /mydrive/yolov4/process.py .
```

8) Run the *process.py* python script to create the *train.txt* & *test.txt* files inside the data folder

Cuplikan kode Terminal

```
/content#
/content# 0;276;0d
```

[0] 52dd68cd\* 23:59 03-Aug-23

0 d selesai pada 06.59

darknet training colab - Pe... x TRAIN A CUSTOM YOLOv4 x yolov4-custom\_TRAINING... x Halaman Tidak Ditemukan x yolov4 - Google Drive x yolov4 - Google Drive x +

colab.research.google.com/drive/1zqRb08jHvIMR4lgAXeNy1kUjDU85B7usp=sharing#scrollTo=\_j6tBzGqv83I

yolov4-custom\_TRAINING.ipynb

File Edit Lihat Sisipkan Runtime Fitur Bantuan Tidak dapat menyimpan perubahan

+ Kode + Teks Salin ke Drive

```
# Copy the obj.names and obj.data files from your drive so that they are now in /darknet/data/ folder

!cp /mydrive/yolov4/obj.names data
!cp /mydrive/yolov4/obj.data data

# verify if the above files are in data folder
!ls data/

labels obj obj.data obj.names

[ ] # Copy the process.py file to the current darknet directory

!cp /mydrive/yolov4/process.py .
```

8) Run the *process.py* python script to create the *train.txt* & *test.txt* files inside the data folder

```
# run process.py ( this creates the train.txt and test.txt files in our darknet/data folder )
!python process.py

# list the contents of data folder to check if the train.txt and test.txt files have been created
!ls data/
```

Cuplikan kode Terminal

```
/content#
/content# 0;276;0d
```

[0] 52dd68cd\* 23:59 03-Aug-23

0 d selesai pada 06.59

darknet training colab - Pe... x TRAIN A CUSTOM YOLOv4 x yolov4-custom\_TRAINING... x Halaman Tidak Ditemukan x yolov4 - Google Drive x yolov4 - Google Drive x +

colab.research.google.com/drive/1zqRb08jHvIMR4lgAXeNy1kUjDU85B7usp=sharing#scrollTo=dh17EufwFp8

yolov4-custom\_TRAINING.ipynb

File Edit Lihat Sisipkan Runtime Fitur Bantuan Tidak dapat menyimpan perubahan

+ Kode + Teks Salin ke Drive

```
python process.py
# list the contents of data folder to check if the train.txt and test.txt files have been created
ls data/

/content/gdrive/My Drive/yolov4/darknet
labels obj obj.data obj.names test.txt train.txt
```

9) Download the pre-trained *yoLov4* weights

```
[ ] # Download the yolov4 pre-trained weights file
!wget https://github.com/AlexeyAB/darknet/releases/download/darknet_yolo_v3_optimal/yolov4.conv.137
```

10) TRAINING

Train your custom detector

For best results, you should stop the training when the average loss is less than 0.05 if possible or at least below 0.3, else train the model until the average loss does not show any significant change for a while.

```
[ ] # train your custom detector! (uncomment %%capture below if you run into memory issues or your Colab is crashing)
```

0 d selesai pada 06.59

darknet training colab - Pe... x TRAIN A CUSTOM YOLOv4 x yolov4-custom\_TRAINING... x Halaman Tidak Ditemukan x yolov4 - Google Drive x yolov4 - Google Drive x +

colab.research.google.com/drive/1zqRb08jHvIMR4lgAXeNy1kUjDU85B7usp=sharing#scrollTo=l6Sy14UfadvK

yolov4-custom\_TRAINING.ipynb

File Edit Lihat Sisipkan Runtime Fitur Bantuan Tidak dapat menyimpan perubahan

+ Kode + Teks Salin ke Drive

```
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/75388965/48bfe50f
-2023-08-04 00:00:13 - https://objects.githubusercontent.com/github-production-release-asset-2e65be/75388965/48bfe50f-11ea
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.108.133, 185.199.109.133, 185.199.110.133, ...
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.108.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 170038676 (162M) [application/octet-stream]
Saving to: 'yolov4.conv.137.2'

yolov4.conv.137.2 100%[=====] 162.16M 70.4MB/s in 2.3s

2023-08-04 00:00:16 (70.4 MB/s) - 'yolov4.conv.137.2' saved [170038676/170038676]
```

10) TRAINING

Train your custom detector

For best results, you should stop the training when the average loss is less than 0.05 if possible or at least below 0.3, else train the model until the average loss does not show any significant change for a while.

```
[ ] # train your custom detector! (uncomment %%capture below if you run into memory issues or your Colab is crashing)
# %%capture
```

2 d selesai pada 07.00

colab.research.google.com/drive/1zqRb08jHvIMR4fgAXeNy1kUjDU85B?usp=sharing#scrollTo=imcONP19hLuq

yolov4-custom\_TRAINING.ipynb

```

# train your custom detector! (uncomment %%capture below if you run into memory issues or your Colab is crashing)
%%capture

!./darknet detector train data/obj.data cfg/yolov4-custom.cfg yolov4.conv.137 -dont_show -map

125 conv 512 3 x 3/ 1 26 x 26 x 256 -> 26 x 26 x 512 1.595 BF
126 conv 256 1 x 1/ 1 26 x 26 x 512 -> 26 x 26 x 256 0.177 BF
127 conv 128 1 x 1/ 1 26 x 26 x 256 -> 26 x 26 x 128 0.044 BF
128 upsample 2x 26 x 26 x 128 -> 52 x 52 x 128
129 route 54 -> 52 x 52 x 256
130 conv 128 1 x 1/ 1 52 x 52 x 256 -> 52 x 52 x 128 0.177 BF
131 route 130 128 -> 52 x 52 x 256
132 conv 128 1 x 1/ 1 52 x 52 x 256 -> 52 x 52 x 128 0.177 BF
133 conv 256 3 x 3/ 1 52 x 52 x 128 -> 52 x 52 x 256 1.595 BF
134 conv 128 1 x 1/ 1 52 x 52 x 256 -> 52 x 52 x 128 0.177 BF
135 conv 256 3 x 3/ 1 52 x 52 x 128 -> 52 x 52 x 256 1.595 BF
136 conv 128 1 x 1/ 1 52 x 52 x 256 -> 52 x 52 x 128 0.177 BF
137 conv 256 3 x 3/ 1 52 x 52 x 128 -> 52 x 52 x 256 1.595 BF
138 conv 21 1 x 1/ 1 52 x 52 x 256 -> 52 x 52 x 21 0.029 BF
139 yolo

[yolo] params: iou_loss: ciou (4), iou_norm: 1.00, obj_norm: 1.00, cls_norm: 1.00, delta_norm: 1.00, scale_x_y: 1.20
nms_kind: greedy (1), beta = 0.600000
140 route 136 -> 52 x 52 x 128
141 conv 256 3 x 3/ 2 52 x 52 x 128 -> 26 x 26 x 256 0.399 BF
142 route 141 126 -> 26 x 26 x 512
143 conv 256 1 x 1/ 1 26 x 26 x 512 -> 26 x 26 x 256 0.177 BF
144 conv 512 3 x 3/ 1 26 x 26 x 256 -> 26 x 26 x 512 1.595 BF
145 conv 256 1 x 1/ 1 26 x 26 x 512 -> 26 x 26 x 256 0.177 BF
146 conv 512 3 x 3/ 1 26 x 26 x 256 -> 26 x 26 x 512 1.595 BF
147 conv 256 1 x 1/ 1 26 x 26 x 512 -> 26 x 26 x 256 0.177 BF

```

Mengeksekusi (8 d) <cell line: 4> -> system() -> \_system\_compat() -> \_run\_command() -> \_monitor\_process() -> \_poll\_process()

colab.research.google.com/drive/1zqRb08jHvIMR4fgAXeNy1kUjDU85B?usp=sharing#scrollTo=oc9S9hbGtauPT

yolov4-custom\_TRAINING.ipynb

```

current avg loss = 0.5683 iteration = 900 approx. time left = 7.98 hours
iteration number in cfg max_batches=6000

```

Check mAP (mean average precision)

```

[18] ##You can check the mAP for all the saved weights to see which gives the best results ( xxxx here is the saved weight number lik

```

2 d selesai pada 08.43

colab.research.google.com/drive/1zqRb08jHvIMR4lgAXeNy1kUjDU85B7usp=sharing#scrollTo=qhlcEb1YIEwu

yolov4-custom\_TRAINING.ipynb

```
nms_kind: greedy_nms (1), beta = 0.600000
Total BFLOPS 59.570
avg_outputs = 489910
Allocate additional workspace_size = 134.22 MB
Loading weights from /mydrive/yolov4/training/yolov4-custom_4000.weights...
seen 64, trained: 256 K-images (4 Kilo-batches_64)
Done! Loaded 162 layers from weights-file

calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
2
detections_count = 2, unique_truth_count = 2
class_id = 0, name = daging_sapi, ap = 100.00% (TP = 1, FP = 1)
class_id = 1, name = daging_babi, ap = 0.00% (TP = 0, FP = 0)

for conf_thresh = 0.25, precision = 0.50, recall = 0.50, F1-score = 0.50
for conf_thresh = 0.25, TP = 1, FP = 1, FN = 1, average IoU = 45.99 %

IoU threshold = 50 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.50) = 0.500000, or 50.00 %
Total Detection Time: 1 Seconds

Set -points flag:
'-points 101' for MS COCO
'-points 11' for PascalVOC 2007 (uncomment 'difficult' in voc.data)
'-points 0' (AUC) for ImageNet, PascalVOC 2010-2012, your custom dataset
```

Cuplikan kode Terminal

```
1 data/obj/2-daging-sapi.jpg
2 data/obj/0-daging-sapi.jpg
3 data/obj/4-daging-sapi.jpg
4 data/obj/3-daging-sapi.jpg
5 data/obj/1-daging-sapi.jpg
6 data/obj/8-daging-sapi.jpg
7 data/obj/10-daging-sapi.jpg
8 data/obj/9-daging-sapi.jpg
9 data/obj/7-daging-sapi.jpg
10 data/obj/5-daging-sapi.jpg
11 data/obj/6-daging-sapi.jpg
12 data/obj/1-daging-babi.jpg
13 data/obj/5-daging-babi.jpg
14 data/obj/2-daging-babi.jpg
15 data/obj/6-daging-babi.jpg
16 data/obj/2-daging-babi.jpg
17 data/obj/0-daging-babi.jpg
18 data/obj/7-daging-babi.jpg
19 data/obj/9-daging-babi.jpg
20 data/obj/10-daging-babi.jpg
21 data/obj/8-daging-babi.jpg
22 data/obj/11-daging-babi.jpg
23
```

12) Test your custom Object Detector

colab.research.google.com/drive/1zqRb08jHvIMR4lgAXeNy1kUjDU85B7usp=sharing#scrollTo=VUBkR6jU4MX

yolov4-custom\_TRAINING.ipynb

```
./yolov4-custom.cfg /mydrive/yolov4/training/yolov4-custom_best.weights /mydrive/mask_test_images/image1.jpg -thresh 0.3

155 conv 1024 3 x 3/ 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BF
156 conv 512 1 x 1/ 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BF
157 conv 1024 3 x 3/ 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BF
158 conv 512 1 x 1/ 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BF
159 conv 1024 3 x 3/ 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BF
160 conv 21 1 x 1/ 1 13 x 13 x1024 -> 13 x 13 x 21 0.007 BF
161 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: 1.05
nms_kind: greedy_nms (1), beta = 0.600000
Total BFLOPS 59.570
avg_outputs = 489910
Allocate additional workspace_size = 134.22 MB
Loading weights from /mydrive/yolov4/training/yolov4-custom_best.weights...
seen 64, trained: 313 K-images (4 Kilo-batches_64)
Done! Loaded 162 layers from weights-file
Cannot load image /mydrive/mask_test_images/image1.jpg
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
/mydrive/mask_test_images/image1.jpg: Predicted in 775.640000 milli-seconds.
daging_sapi: 100%
OpenCV exception: show_image_cv
```

Cuplikan kode Terminal

```
1 data/obj/2-daging-sapi.jpg
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8 data/obj/9-daging-sapi.jpg
9 data/obj/7-daging-sapi.jpg
10 data/obj/5-daging-sapi.jpg
11 data/obj/6-daging-sapi.jpg
12 data/obj/1-daging-babi.jpg
13 data/obj/5-daging-babi.jpg
14 data/obj/2-daging-babi.jpg
15 data/obj/6-daging-babi.jpg
16 data/obj/4-daging-babi.jpg
17 data/obj/0-daging-babi.jpg
18 data/obj/7-daging-babi.jpg
19 data/obj/9-daging-babi.jpg
20 data/obj/10-daging-babi.jpg
21 data/obj/8-daging-babi.jpg
22 data/obj/11-daging-babi.jpg
23
```

26 d selesai pada 08.48