**Novelsense Khadas**

Contents

[**1** **Summary** 4](#_Toc106857852)

[**2** **Ubuntu PC in TECO** 5](#_Toc106857853)

[**3** **RE-Installation** 5](#_Toc106857854)

[3.1 Reinstallation after it was corrupt 5](#_Toc106857855)

[3.2 Accessing using SSH 5](#_Toc106857856)

[**4** **Khadas PC** 6](#_Toc106857857)

[4.1 Accessing using SSH 6](#_Toc106857858)

[**5** **NPU Examples** 7](#_Toc106857859)

[5.1 Prebuilt NPU Demo 7](#_Toc106857860)

[*5.1.1* *Inception Model* 7](#_Toc106857861)

[5.1.2 Yolo Series Model X11 9](#_Toc106857862)

[*5.1.3* *Yolo Series Model FB gives error on Monitor* 11](#_Toc106857863)

[5.1.4 Yolo Series Model X11 with own picture 11](#_Toc106857864)

[*5.1.5* *Yolo Series Model FB with own picture* 13](#_Toc106857865)

[5.2 NPU SDK 15](#_Toc106857866)

[5.2.1 How to upgrade to Python 3.8 on Ubuntu 18.04 LTS 16](#_Toc106857867)

[*5.2.2* *INSTALL TENSORFLOW 2.0.XXX* 18](#_Toc106857868)

[5.2.3 Conversion Script 19](#_Toc106857869)

[5.3 NPU Demo Source Code 21](#_Toc106857870)

[5.3.1 Another trial 24](#_Toc106857871)

[5.4 Model Convert 28](#_Toc106857872)

[*5.4.1* DARKNET 28](#_Toc106857873)

[*5.4.2* *Modify scripts 0\_import\_model.sh* 30](#_Toc106857874)

[*5.4.3* Replace VNN File from PC to Khadas 32](#_Toc106857875)

[*5.4.4* *continued on khadas* 32](#_Toc106857876)

[5.5 NPU Performance 35](#_Toc106857877)

[5.6 NPU Operation Usage Times 35](#_Toc106857878)

[5.7 Tengine SDK 36](#_Toc106857879)

[5.8 Tengine Demo 36](#_Toc106857880)

[5.9 KSNN(Python API) 36](#_Toc106857881)

[5.9.1 KSNN Usage 36](#_Toc106857882)

[5.9.2 KSNN Convert tool 36](#_Toc106857883)

[5.9.3 KSNN API 36](#_Toc106857884)

[**6** **Example to get own network running on khadas board (WINDOWS DOCKER)** 36](#_Toc106857885)

[6.1 Installing Docker 36](#_Toc106857886)

[6.1.1 Torch error 36](#_Toc106857887)

[6.2 Execution on Windows 10 36](#_Toc106857888)

[6.2.1 1\_create\_and\_export\_network 36](#_Toc106857889)

[6.2.2 2\_convert\_network 36](#_Toc106857890)

[6.2.3 3\_run\_network 38](#_Toc106857891)

[**7** **Example to get own network running on khadas board (WINDOWS UBUNTU)** 38](#_Toc106857892)

[7.1 Khadas Forum Questions 39](#_Toc106857893)

[7.1.1 Mine 39](#_Toc106857894)

[7.1.2 Others 39](#_Toc106857895)

[7.1.3 Articles: 39](#_Toc106857896)

[7.2 YOLO-V3 Generating NB file and Execution 40](#_Toc106857897)

[7.2.1 Could not Run Yolo-v3 with the already installed Khadas Image and existing SDK Conversion – did not work 40](#_Toc106857898)

[7.2.2 Tried with 6.4.6.2 SDK Version also – did not work 40](#_Toc106857899)

[7.2.3 Tried with most recent SDK – did not work 40](#_Toc106857900)

[7.2.4 Installed new khadas VIM3 image 40](#_Toc106857901)

[7.2.5 Tried with existing SDK – did not work 40](#_Toc106857902)

[7.2.6 Tried with 6.4.6.2 SDK Version also – did not work 40](#_Toc106857903)

[7.2.7 Tried with most recent SDK – did not work 40](#_Toc106857904)

[7.2.8 Got another cfg and weights for Yolo-v3 from the @Frank 40](#_Toc106857905)

[7.2.9 Tried with existing SDK – did not work 40](#_Toc106857906)

[7.2.10 Tried with 6.4.6.2 SDK Version also – did not work 40](#_Toc106857907)

[7.2.11 Tried with most recent SDK – worked but did not detect properly 40](#_Toc106857908)

[7.2.12 Changed the channel mean value parameters, as recommended by @Frank 40](#_Toc106857909)

[7.2.13 Tried with existing SDK – did not work 40](#_Toc106857910)

[7.2.14 Tried with 6.4.6.2 SDK Version also – did not work 40](#_Toc106857911)

[7.2.15 Tried with most recent SDK – worked but did not detect for some pictures 40](#_Toc106857912)

[7.2.16 Tried to change the picture sizes and types – did not work 40](#_Toc106857913)

[7.2.17 Then found that the size should be multiple of 32, changed the picture size accordingly, then, it works. 40](#_Toc106857914)

[7.2.18 Tried on the recent SDK on the previous VIM3 Image, it worked fine then. 40](#_Toc106857915)

[7.3 Standalone Yolo-v3 Code 40](#_Toc106857916)

[8 Tried with the code converted from existing SDK 41](#_Toc106857917)

[9 Tried with the code converted from 6.4.6.2 SDK 41](#_Toc106857918)

[10 Tried with the code converted from recent SDK – worked 41](#_Toc106857919)

[11 Summary Till 17.06.2022 41](#_Toc106857920)

1. **Summary**

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1. **Ubuntu PC in TECO**
2. **RE-Installation**

## Reinstallation after it was corrupt

Don't know why the Ubuntu was corrupted and has to reinstall the ubuntu 18.04 from the USB

Gives the follow error:

Error: unknown filesystem.

grub rescue>

1. Install the SSH server service on the Ubuntu

sajjad@teco:~$ installing ssh server ^C

sajjad@teco:~$ip addr show

sajjad@teco:~$sudo apt update

sajjad@teco:~$sudo apt install openssh-server

sajjad@teco:~$sudo systemctl status ssh

sajjad@teco:~$sudo ufw allow ssh

sajjad@teco:~$

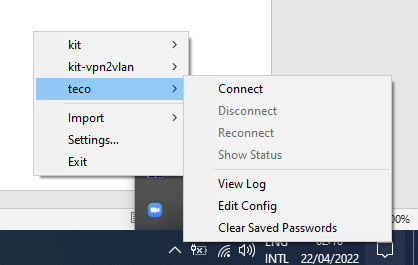
sajjad@teco:~$ uname -a

Linux teco 5.4.0-84-generic #94~18.04.1-Ubuntu SMP Thu Aug 26 23:17:46 UTC 2021 x86\_64 x86\_64 x86\_64 GNU/Linux

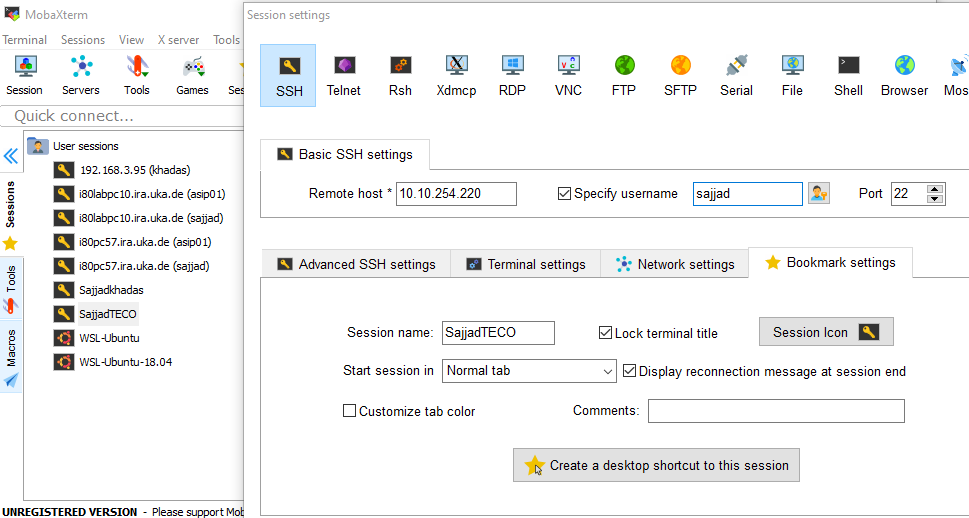
1. Install the Docker
2. Install the python
3. Install the GIT and configure it

## Accessing using SSH

1. Install the SSH server service on the Ubuntu
2. Install the OpenVPN on the laptop.
3. Run the OpenVPN and import teco.config file
4. Connect to the TECO VPN from the OpenVPN, use your TECO user name and passwords



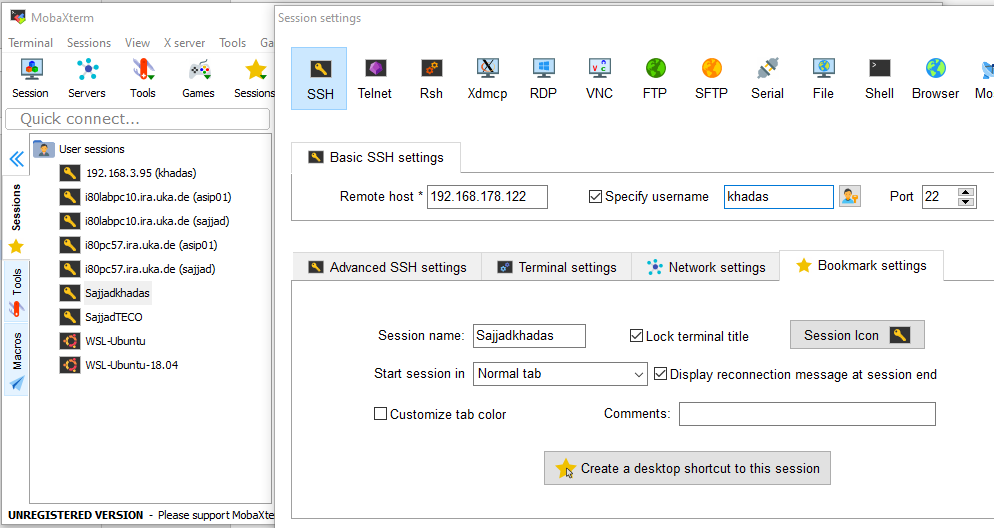
1. Install the MobaXterm or any other SSH Terminal.
2. Then note down the IP address of the ubuntu PC and configure the MobaXterm SSH terminal



1. **Khadas PC**

## Accessing using SSH

1. Install the SSH server service on the Khadas
2. Then note down the IP address of the ubuntu PC and configure the MobaXterm SSH terminal



1. **NPU Examples**

## Prebuilt NPU Demo

NPU Prebuilt Demo Usage

https://docs.khadas.com/linux/vim3/NPUPrebuiltUsage.html

khadas@Khadas-teco:~$ ls

aml\_npu\_sdk Desktop Downloads Music nn Public Templ

'copy\_to\_board executing on ksnn khadas.log' Documents ksnn my\_video-1.mkv Pictures sajjad venv

khadas@Khadas-teco:~$ cd sajjad/

applsource1/ eachoptime/ eachoptime1/ ksnn/ npu1/ npusdk1/

khadas@Khadas-teco:~$ cd sajjad/applsource1/

khadas@Khadas-teco:~/sajjad/applsource1$ cd aml\_npu\_app/

DDK\_6.3.3.4/ DDK\_6.4.0.3/ DDK\_6.4.3/ DDK\_6.4.4.3/ detect\_library/ .git/ NN\_SLT/

khadas@Khadas-teco:~/sajjad/applsource1$ cd aml\_npu\_app/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ ls

DDK\_6.3.3.4 DDK\_6.4.0.3 DDK\_6.4.3 DDK\_6.4.4.3 detect\_library LICENSE NN\_SLT

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ ls detect\_library/

inception sample\_demo\_fb source\_code yolo\_demo\_fb\_usb yolo\_demo\_x11\_usb

model\_code sample\_demo\_x11 yolo\_demo\_fb\_mipi yolo\_demo\_x11\_mipi

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ ls detect\_library/source\_code/

bin\_r build\_vx.sh detect.c detect\_log.c include Makefile makefile.linux makefile.linux.def

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ cd

khadas@Khadas-teco:~$ cd sajjad/npu1/

### *Inception Model*

khadas@Khadas-teco:~/sajjad/npu1$ ls

aml\_npu\_demo\_binaries

khadas@Khadas-teco:~/sajjad/npu1$ cd aml\_npu\_demo\_binaries/

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries$ ls

detect\_demo detect\_demo\_picture detect\_demo\_picture\_original inceptionv3 LICENSE README.md

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries$ ls inceptionv3/

dog\_299x299.jpg goldfish\_299x299.jpg imagenet\_slim\_labels.txt VIM3 VIM3L

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries$ cd inceptionv3/

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3$ cd VIM3

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3/VIM3$ ./run.sh

Create Neural Network: 1820ms or 1820271us

Verify...

Verify Graph: 29ms or 29602us

Start run graph [1] times...

Run the 1 time: 36.00ms or 36340.00us

vxProcessGraph execution time:

Total 37.00ms or 37187.00us

Average 37.19ms or 37187.00us

--- Top5 ---

2: 0.934082

795: 0.003748

408: 0.001803

974: 0.001579

393: 0.000868

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3/VIM3$ ls

inceptionv3 inception\_v3.nb input\_0.dat output0\_1001\_1.dat run.sh

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3/VIM3$ ls inception3

ls: cannot access 'inception3': No such file or directory

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3/VIM3$ cd ..

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3$ ls

dog\_299x299.jpg goldfish\_299x299.jpg imagenet\_slim\_labels.txt VIM3 VIM3L

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3$ vim VIM3/run.sh

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3$ ls

dog\_299x299.jpg goldfish\_299x299.jpg imagenet\_slim\_labels.txt VIM3 VIM3L

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3$ cd VIM3

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3/VIM3$ cp run.sh run\_dog.sh

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3/VIM3$ chmod +x run\_dog.sh

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3/VIM3$ vim run\_dog.sh

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3/VIM3$ ./run\_dog.sh

Create Neural Network: 697ms or 697171us

Verify...

Verify Graph: 31ms or 31712us

Start run graph [1] times...

Run the 1 time: 21.00ms or 21177.00us

vxProcessGraph execution time:

Total 21.00ms or 21222.00us

Average 21.22ms or 21222.00us

--- Top5 ---

208: 0.710449

209: 0.049713

223: 0.016052

185: 0.005543

268: 0.005543

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/inceptionv3/VIM3$

### Yolo Series Model X11

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 0 -p ./1080p.bmp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:967.347 right:1266.4 top:63.3736 bottom:518.165

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 1 -p ./1080p.bmp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:230.364 right:1689.64 top:0 bottom:1080

left:240.364 top-10:40

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 2 -p ./1080p.bmp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:608

model.height:608

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=0

result type is 0

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 3 -p ./1080p.bmp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=0

result type is 0

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 4 -p ./1080p.bmp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:372.992 right:1510.84 top:0 bottom:1080

left:382.992 top-10:40

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$

### *Yolo Series Model FB gives error on Monitor*

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_fb -m 0 -p ./1080p.bmp

init\_fb...

1920x1080, 32bpp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:967.347 right:1266.4 top:63.3736 bottom:518.165

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$

### Yolo Series Model X11 with own picture

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 0 -p ./6.jpg

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:565.104 right:695.876 top:376.414 bottom:547.763

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 0 -p ./6.jpg

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:565.104 right:695.876 top:376.414 bottom:547.763

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 1 -p ./6.jpg

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:305.405 right:941.916 top:345.288 bottom:1080

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 3 -p ./6.jpg

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:381.037 right:866.284 top:447.508 bottom:1010.87

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_x11 -m 4 -p ./6.jpg

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:353.168 right:863.582 top:344.398 bottom:1080

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ eog 1080p.bmp

### *Yolo Series Model FB with own picture*

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_fb -m 4 -p ./6.jpg

init\_fb...

1920x1080, 32bpp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:353.168 right:863.582 top:344.398 bottom:1080

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_fb -m 3 -p ./6.jpg

init\_fb...

1920x1080, 32bpp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:381.037 right:866.284 top:447.508 bottom:1010.87

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_fb -m 2 -p ./6.jpg

init\_fb...

1920x1080, 32bpp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:608

model.height:608

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=0

result type is 0

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ./detect\_demo\_fb -m 1 -p ./6.jpg

init\_fb...

1920x1080, 32bpp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:305.405 right:941.916 top:345.288 bottom:1080

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$

## NPU SDK

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NPU SDK Usage

https://docs.khadas.com/linux/vim3/NPUSDK.html

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sajjad@teco:~/sajjad$ clear

sajjad@teco:~/sajjad$ mkdir npusdk

sajjad@teco:~/sajjad$ cd npusdk/

sajjad@teco:~/sajjad/npusdk$ BASIS REPO^C

sajjad@teco:~/sajjad/npusdk$ git clone --recursive https://github.com/khadas/aml\_npu\_sdk.git

Cloning into 'aml\_npu\_sdk'...

remote: Enumerating objects: 462, done.

remote: Counting objects: 100% (462/462), done.

remote: Compressing objects: 100% (206/206), done.

remote: Total 462 (delta 259), reused 440 (delta 237), pack-reused 0

Receiving objects: 100% (462/462), 24.96 MiB | 23.27 MiB/s, done.

Resolving deltas: 100% (259/259), done.

Submodule 'acuity-toolkit/bin' (https://gitlab.com/khadas/neural\_network\_large\_file.git) registered for path 'acuity-toolkit/bin'

Submodule 'acuity-toolkit/python' (https://gitlab.com/khadas/neural\_network\_large\_file.git) registered for path 'acuity-toolkit/python'

Cloning into '/home/sajjad/sajjad/npusdk/aml\_npu\_sdk/acuity-toolkit/bin'...

remote: Enumerating objects: 13561, done.

remote: Counting objects: 100% (2746/2746), done.

remote: Compressing objects: 100% (2491/2491), done.

remote: Total 13561 (delta 549), reused 1689 (delta 202), pack-reused 10815

Receiving objects: 100% (13561/13561), 3.63 GiB | 26.74 MiB/s, done.

Resolving deltas: 100% (2798/2798), done.

Cloning into '/home/sajjad/sajjad/npusdk/aml\_npu\_sdk/acuity-toolkit/python'...

remote: Enumerating objects: 13561, done.

remote: Counting objects: 100% (2746/2746), done.

remote: Compressing objects: 100% (2491/2491), done.

remote: Total 13561 (delta 549), reused 1689 (delta 202), pack-reused 10815

Receiving objects: 100% (13561/13561), 3.63 GiB | 47.62 MiB/s, done.

Resolving deltas: 100% (2798/2798), done.

Submodule path 'acuity-toolkit/bin': checked out 'b5d6cfcbac1ffa579a9e409490b435e24f3fbca3'

Submodule path 'acuity-toolkit/python': checked out '383bdd85c57529b3c7606f7a107fe55df6ac38ad'

sajjad@teco:~/sajjad/npusdk$ cd ..

sajjad@teco:~/sajjad$ cp -r npusdk npusdk1

sajjad@teco:~/sajjad$ NPU SDK Usage^C

sajjad@teco:~/sajjad$ cd npusdk1/

sajjad@teco:~/sajjad/npusdk1$ cd aml\_npu\_sdk/acuity-toolkit/

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ ls

bin demo python ReadMe.txt requirements.txt

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ sudo apt-get install python3-pip python3-virtualenv

[sudo] password for sajjad:

Reading package lists... Done

Building dependency tree

Reading state information... Done

The following packages were automatically installed and are no longer required:

...

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ pip3 install tensorflow==2.0.0a0

Collecting tensorflow==2.0.0a0

Could not find a version that satisfies the requirement tensorflow==2.0.0a0 (from versions: 0.12.1, 1.0.0, 1.0.1, 1.1.0, 1.2.0, 1.2.1, 1.3.0, 1.4.0, 1.4.1, 1.5.0, 1.5.1, 1.6.0, 1.7.0, 1.7.1, 1.8.0, 1.9.0, 1.10.0, 1.10.1, 1.11.0, 1.12.0, 1.12.2, 1.12.3, 1.13.1, 1.13.2, 1.14.0)

No matching distribution found for tensorflow==2.0.0a0

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$

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### How to upgrade to Python 3.8 on Ubuntu 18.04 LTS

https://www.itsupportwale.com/blog/how-to-upgrade-to-python-3-8-on-ubuntu-18-04-lts/

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sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ python3 -V

Python 3.6.9

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ sudo add-apt-repository ppa:deadsnakes/ppa

This PPA contains more recent Python versions packaged for Ubuntu.

...

Fetched 1.079 kB in 1s (1.836 kB/s)

Reading package lists... Done

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ apt-get update

Reading package lists... Done

E: Could not open lock file /var/lib/apt/lists/lock - open (13: Permission denied)

E: Unable to lock directory /var/lib/apt/lists/

W: Problem unlinking the file /var/cache/apt/pkgcache.bin - RemoveCaches (13: Permission denied)

W: Problem unlinking the file /var/cache/apt/srcpkgcache.bin - RemoveCaches (13: Permission denied)

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ sudo apt-get update

Hit:1 https://download.docker.com/linux/ubuntu bionic InRelease

Hit:2 http://ppa.launchpad.net/deadsnakes/ppa/ubuntu bionic InRelease

Hit:3 http://de.archive.ubuntu.com/ubuntu bionic InRelease

Hit:4 http://de.archive.ubuntu.com/ubuntu bionic-updates InRelease

Hit:5 http://de.archive.ubuntu.com/ubuntu bionic-backports InRelease

Hit:6 http://security.ubuntu.com/ubuntu bionic-security InRelease

Reading package lists... Done

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ sudo apt list | grep python3.8

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

idle-python3.8/bionic,bionic 3.8.13-1+bionic1 all

libpython3.8/bionic 3.8.13-1+bionic1 amd64

libpython3.8-dbg/bionic 3.8.13-1+bionic1 amd64

libpython3.8-dev/bionic 3.8.13-1+bionic1 amd64

libpython3.8-minimal/bionic 3.8.13-1+bionic1 amd64

libpython3.8-stdlib/bionic 3.8.13-1+bionic1 amd64

libpython3.8-testsuite/bionic,bionic 3.8.13-1+bionic1 all

python3.8/bionic 3.8.13-1+bionic1 amd64

python3.8-dbg/bionic 3.8.13-1+bionic1 amd64

python3.8-dev/bionic 3.8.13-1+bionic1 amd64

python3.8-doc/bionic,bionic 3.8.12-1+bionic2 all

python3.8-examples/bionic,bionic 3.8.13-1+bionic1 all

python3.8-full/bionic 3.8.13-1+bionic1 amd64

python3.8-minimal/bionic 3.8.13-1+bionic1 amd64

python3.8-venv/bionic 3.8.13-1+bionic1 amd64

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ sudo apt-get install python3.8

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ sudo update-alternatives --install /usr/bin/python3 python3 /usr/bin/python3.6 1

update-alternatives: using /usr/bin/python3.6 to provide /usr/bin/python3 (python3) in auto mode

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ sudo update-alternatives --install /usr/bin/python3 python3 /usr/bin/python3.8 2

update-alternatives: using /usr/bin/python3.8 to provide /usr/bin/python3 (python3) in auto mode

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ python3 -V

Python 3.8.13

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ python -V

Traceback (most recent call last):

File "/usr/lib/command-not-found", line 28, in <module>

from CommandNotFound import CommandNotFound

File "/usr/lib/python3/dist-packages/CommandNotFound/CommandNotFound.py", line 19, in <module>

from CommandNotFound.db.db import SqliteDatabase

File "/usr/lib/python3/dist-packages/CommandNotFound/db/db.py", line 5, in <module>

import apt\_pkg

ModuleNotFoundError: No module named 'apt\_pkg'

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ sudo update-alternatives --config python3

There are 2 choices for the alternative python3 (providing /usr/bin/python3).

Selection Path Priority Status

------------------------------------------------------------

\* 0 /usr/bin/python3.8 2 auto mode

1 /usr/bin/python3.6 1 manual mode

2 /usr/bin/python3.8 2 manual mode

Press <enter> to keep the current choice[\*], or type selection number: 0

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$

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### *INSTALL TENSORFLOW 2.0.XXX*

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sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ python3 -V

Python 3.8.13

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ sudo apt install python3-venv

Reading package lists... Done

Building dependency tree

Reading state information... Done

python3-venv is already the newest version (3.6.7-1~18.04).

The following packages were automatically installed and are no longer required:

docker-ce-rootless-extras docker-scan-plugin

Use 'sudo apt autoremove' to remove them.

0 upgraded, 0 newly installed, 0 to remove and 25 not upgraded.

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ rm -rf tensorflow\_cpu-2.8.0-cp3\*

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ ls

bin demo python ReadMe.txt requirements.txt

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit$ cd

sajjad@teco:~$ mkdir my\_tensorflow

sajjad@teco:~$ cd my\_tensorflow/

sajjad@teco:~/my\_tensorflow$ python3 -m venv venv

Error: Command '['/home/sajjad/my\_tensorflow/venv/bin/python3', '-Im', 'ensurepip', '--upgrade', '--default-pip']' returned non-zero exit status 1.

sajjad@teco:~/my\_tensorflow$ python3 -m venv --system-site-packages ./venv

Error: Command '['/home/sajjad/my\_tensorflow/venv/bin/python3', '-Im', 'ensurepip', '--upgrade', '--default-pip']' returned non-zero exit status 1.

sajjad@teco:~/my\_tensorflow$ Error: Command '['/home/sajjad/my\_tensorflow/venv/bin/python3', '-Im', 'ensurepip', '--upgrade', '--default-pip']' returned non-zero exit status 1.^C

sajjad@teco:~/my\_tensorflow$ sudo apt-get install python3.8-venv

Reading package lists... Done

Building dependency tree

Reading state information... Done

The following packages were automatically installed and are no longer required:

docker-ce-rootless-extras docker-scan-plugin

Use 'sudo apt autoremove' to remove them.

The following NEW packages will be installed:

python3.8-venv

0 upgraded, 1 newly installed, 0 to remove and 25 not upgraded.

Need to get 2.701 kB of archives.

After this operation, 2.935 kB of additional disk space will be used.

Get:1 http://ppa.launchpad.net/deadsnakes/ppa/ubuntu bionic/main amd64 python3.8-venv amd64 3.8.13-1+bionic1 [2.701 kB]

Fetched 2.701 kB in 0s (8.150 kB/s)

Selecting previously unselected package python3.8-venv.

(Reading database ... 179131 files and directories currently installed.)

Preparing to unpack .../python3.8-venv\_3.8.13-1+bionic1\_amd64.deb ...

Unpacking python3.8-venv (3.8.13-1+bionic1) ...

Setting up python3.8-venv (3.8.13-1+bionic1) ...

sajjad@teco:~/my\_tensorflow$ python3 -m venv --system-site-packages ./venv

sajjad@teco:~/my\_tensorflow$ source ./venv/bin/activate

(venv) sajjad@teco:~/my\_tensorflow$ pip install --upgrade pip

Requirement already satisfied: pip in ./venv/lib/python3.8/site-packages (22.0.4)

(venv) sajjad@teco:~/my\_tensorflow$ pip install --upgrade tensorflow

Collecting tensorflow

Downloading tensorflow-2.8.0-cp38-cp38-manylinux2010\_x86\_64.whl (497.6 MB)

━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 497.6/497.6 MB 5.2 MB/s eta 0:00:00

....

Successfully installed absl-py-1.0.0 astunparse-1.6.3 cachetools-5.0.0 charset-normalizer-2.0.12 flatbuffers-2.0 gast-0.5.3 google-auth-2.6.5 google-auth-oauthlib-0.4.6 google-pasta-0.2.0 grpcio-1.44.0 h5py-3.6.0 importlib-metadata-4.11.3 keras-2.8.0 keras-preprocessing-1.1.2 libclang-13.0.0 markdown-3.3.6 numpy-1.22.3 oauthlib-3.2.0 opt-einsum-3.3.0 protobuf-3.20.0 pyasn1-0.4.8 pyasn1-modules-0.2.8 requests-2.27.1 requests-oauthlib-1.3.1 rsa-4.8 six-1.16.0 tensorboard-2.8.0 tensorboard-data-server-0.6.1 tensorboard-plugin-wit-1.8.1 tensorflow-2.8.0 tensorflow-io-gcs-filesystem-0.24.0 termcolor-1.1.0 tf-estimator-nightly-2.8.0.dev2021122109 typing-extensions-4.1.1 werkzeug-2.1.1 wrapt-1.14.0 zipp-3.8.0

(venv) sajjad@teco:~/my\_tensorflow$ python -c 'import tensorflow as tf; print(tf.\_\_version\_\_)'

2022-04-15 08:04:46.791206: W tensorflow/stream\_executor/platform/default/dso\_loader.cc:64] Could not load dynamic library 'libcudart.so.11.0'; dlerror: libcudart.so.11.0: cannot open shared object file: No such file or directory

2022-04-15 08:04:46.791232: I tensorflow/stream\_executor/cuda/cudart\_stub.cc:29] Ignore above cudart dlerror if you do not have a GPU set up on your machine.

2.8.0

(venv) sajjad@teco:~/my\_tensorflow$ deactivate

sajjad@teco:~/my\_tensorflow$

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### Conversion Script

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sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ clear

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ ls

0\_import\_model.sh 1\_quantize\_model.sh 2\_export\_case\_code.sh data extractoutput.py inference.sh model

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ head -20 0\_import\_model.sh

#!/bin/bash

NAME=mobilenet\_tf

ACUITY\_PATH=../bin/

convert\_caffe=${ACUITY\_PATH}convertcaffe

convert\_tf=${ACUITY\_PATH}convertensorflow

convert\_tflite=${ACUITY\_PATH}convertflit

convert\_darknet=${ACUITY\_PATH}convertdarknet

convert\_onnx=${ACUITY\_PATH}convertonnx

convert\_keras=${ACUITY\_PATH}convertkeras

convert\_pytorch=${ACUITY\_PATH}convertpytorch

$convert\_tf \

--tf-pb ./model/mobilenet\_v1.pb \

--inputs input \

--input-size-list '224,224,3' \

--outputs MobilenetV1/Predictions/Softmax \

--net-output ${NAME}.json \

--data-output ${NAME}.data

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ head -20 1\_quantize\_model.sh

#!/bin/bash

NAME=mobilenet\_tf

ACUITY\_PATH=../bin/

tensorzone=${ACUITY\_PATH}tensorzonex

$tensorzone \

--action quantization \

--dtype float32 \

--source text \

--source-file data/validation\_tf.txt \

--channel-mean-value '128 128 128 128' \

--reorder-channel '0 1 2' \

--model-input ${NAME}.json \

--model-data ${NAME}.data \

--quantized-dtype asymmetric\_affine-u8 \

--quantized-rebuild \

# --batch-size 2 \

# --epochs 5

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ head -20 2\_export\_case\_code.sh

#!/bin/bash

NAME=mobilenet\_tf

ACUITY\_PATH=../bin/

export\_ovxlib=${ACUITY\_PATH}ovxgenerator

$export\_ovxlib \

--model-input ${NAME}.json \

--data-input ${NAME}.data \

--model-quantize ${NAME}.quantize \

--reorder-channel '0 1 2' \

--channel-mean-value '128 128 128 128' \

--export-dtype quantized \

--optimize VIPNANOQI\_PID0XE8 \

--viv-sdk ${ACUITY\_PATH}vcmdtools \

--pack-nbg-unify \

#Note:

# --optimize VIPNANOQI\_PID0XB9

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ ls

0\_import\_model.sh 1\_quantize\_model.sh 2\_export\_case\_code.sh data extractoutput.py inference.sh model

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ bash 0\_import\_model.sh && bash 1\_quantize\_model.sh && bash 2\_export\_case\_code.sh

2022-04-15 08:09:43.201344: W tensorflow/stream\_executor/platform/default/dso\_loader.cc:59] Could not load dynamic library 'libcudart.so.10.1'; dlerror: libcudart.so.10.1: cannot open shared object file: No such file or directory; LD\_LIBRARY\_PATH: /home/sajjad/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/bin/acuitylib

2022-04-15 08:09:43.201367: I tensorflow/stream\_executor/cuda/cudart\_stub.cc:29] Ignore above cudart dlerror if you do not have a GPU set up on your machine.

I Start importing tensorflow...

...

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

/home/sajjad/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo

/

/home/sajjad/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo\_nbg\_unify

I ----------------Error(0),Warning(0)----------------

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ ls

0\_import\_model.sh 2\_export\_case\_code.sh extractoutput.py mobilenet\_tf\_normal\_case\_demo nbg\_unify\_mobilenet\_tf

1\_quantize\_model.sh data inference.sh model

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ ls mobilenet\_tf\_normal\_case\_demo/

BUILD makefile.linux mobilenettf.vcxproj vnn\_mobilenettf.c vnn\_post\_process.c vnn\_pre\_process.c

main.c mobilenet\_tf.export.data vnn\_global.h vnn\_mobilenettf.h vnn\_post\_process.h vnn\_pre\_process.h

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ ls nbg\_unify\_mobilenet\_tf/

BUILD makefile.linux mobilenettf.vcxproj vnn\_global.h vnn\_mobilenettf.h vnn\_post\_process.h vnn\_pre\_process.h

main.c mobilenet\_tf.nb nbg\_meta.json vnn\_mobilenettf.c vnn\_post\_process.c vnn\_pre\_process.c

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$ After the conversion is completed, you can see the converted code in the nbg\_unify\_xxxx directory, here is the built-in model as an example^C

sajjad@teco:~/sajjad/npusdk1/aml\_npu\_sdk/acuity-toolkit/demo$

## NPU Demo Source Code

Application Source Code

https://docs.khadas.com/linux/vim3/NPUApp.html

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ cd ..

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries$ cd ..

khadas@Khadas-teco:~/sajjad/npu1$ cd ..

khadas@Khadas-teco:~/sajjad$ ls

applsource1 eachoptime eachoptime1 ksnn npu1 npusdk1

khadas@Khadas-teco:~/sajjad$ cd applsource1/

khadas@Khadas-teco:~/sajjad/applsource1$ ls

aml\_npu\_app

khadas@Khadas-teco:~/sajjad/applsource1$ cd aml\_npu\_app/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ ls

DDK\_6.3.3.4 DDK\_6.4.0.3 DDK\_6.4.3 DDK\_6.4.4.3 detect\_library LICENSE NN\_SLT

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ ls detect\_library/

inception model\_code sample\_demo\_fb sample\_demo\_x11 source\_code yolo\_demo\_fb\_mipi yolo\_demo\_fb\_usb yolo\_demo\_x11\_mipi yolo\_demo\_x11\_usb

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ ls

DDK\_6.3.3.4 DDK\_6.4.0.3 DDK\_6.4.3 DDK\_6.4.4.3 detect\_library LICENSE NN\_SLT

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ sudo apt update

[sudo] password for khadas:

Hit:1 http://ports.ubuntu.com focal InRelease

Get:2 http://ports.ubuntu.com focal-security InRelease [114 kB]

Hit:3 http://deb.anydesk.com all InRelease

Hit:4 https://linux.teamviewer.com/deb stable InRelease

Hit:5 http://dl.khadas.com/repos/vim3 focal InRelease

Get:6 http://ports.ubuntu.com focal-updates InRelease [114 kB]

Get:7 http://ports.ubuntu.com focal-backports InRelease [108 kB]

Get:8 http://ports.ubuntu.com focal-security/main arm64 DEP-11 Metadata [40.7 kB]

Get:9 http://ports.ubuntu.com focal-security/universe arm64 DEP-11 Metadata [66.3 kB]

Get:10 http://ports.ubuntu.com focal-updates/main arm64 Packages [1,177 kB]

Get:11 http://ports.ubuntu.com focal-updates/main armhf Packages [979 kB]

Get:12 http://ports.ubuntu.com focal-updates/main arm64 DEP-11 Metadata [279 kB]

Get:13 http://ports.ubuntu.com focal-updates/universe arm64 Packages [866 kB]

Get:14 http://ports.ubuntu.com focal-updates/universe armhf Packages [758 kB]

Get:15 http://ports.ubuntu.com focal-updates/universe arm64 DEP-11 Metadata [389 kB]

Get:16 http://ports.ubuntu.com focal-backports/main arm64 DEP-11 Metadata [8,008 B]

Get:17 http://ports.ubuntu.com focal-backports/universe arm64 DEP-11 Metadata [30.8 kB]

Fetched 4,929 kB in 3s (1,771 kB/s)

Reading package lists... Done

Building dependency tree

Reading state information... Done

56 packages can be upgraded. Run 'apt list --upgradable' to see them.

N: Skipping acquire of configured file 'main/binary-arm64/Packages' as repository 'http://deb.anydesk.com all InRelease' doesn't support architecture 'arm64'

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ sudo apt install libopencv-dev python3-opencv

Reading package lists... Done

Building dependency tree

Reading state information... Done

libopencv-dev is already the newest version (4.2.0+dfsg-5).

python3-opencv is already the newest version (4.2.0+dfsg-5).

The following packages were automatically installed and are no longer required:

libfwupdplugin1 libllvm11

Use 'sudo apt autoremove' to remove them.

0 upgraded, 0 newly installed, 0 to remove and 56 not upgraded.

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ ls detect\_library/model\_code

detect\_mtcnn detect\_yoloface detect\_yolo\_v2 detect\_yolo\_v3 detect\_yolo\_v3\_original detect\_yolo\_v3\_tiny detect\_yolo\_v4 facenet

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ ls detect\_library/model\_code/detect\_yolo\_v3

bin\_r build\_vx.sh include linux\_build\_sample.log makefile.linux makefile.linux.def makefile.target\_name vnn\_yolov3.c yolo\_v3.c yolov3\_process.c

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ ls detect\_library/sample\_demo\_x11/

1080p.bmp build\_vx.sh emb.db main.cpp makefile.linux.def nn\_detect\_common.h nn\_detect\_utils.h result

bin\_r\_cv4 detect.h linux\_build\_sample.log makefile.linux makefile.target\_name nn\_detect.h ReadMe.txt

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app$ cd detect\_library/model\_code/detect\_yolo\_v3

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ ls

bin\_r build\_vx.sh include linux\_build\_sample.log makefile.linux makefile.linux.def makefile.target\_name vnn\_yolov3.c yolo\_v3.c yolov3\_process.c

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ Compile Library^C

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ ./build\_vx.sh

make: Nothing to be done for 'all'.

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ cd bin\_r/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/bin\_r$ ls

libnn\_yolo\_v3.so vnn\_yolov3.o vnn\_yolov3\_original.o yolo\_v3.o yolo\_v3\_original.o yolov3\_process.o

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/bin\_r$ cd ..

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ ls

bin\_r build\_vx.sh include linux\_build\_sample.log makefile.linux makefile.linux.def makefile.target\_name vnn\_yolov3.c yolo\_v3.c yolov3\_process.c

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ cd ..

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code$ ls

detect\_mtcnn detect\_yoloface detect\_yolo\_v2 detect\_yolo\_v3 detect\_yolo\_v3\_original detect\_yolo\_v3\_tiny detect\_yolo\_v4 facenet

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/model\_code$ cd ..

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library$ cd sample\_demo\_x11/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ls

1080p.bmp build\_vx.sh emb.db main.cpp makefile.linux.def nn\_detect\_common.h nn\_detect\_utils.h result

bin\_r\_cv4 detect.h linux\_build\_sample.log makefile.linux makefile.target\_name nn\_detect.h ReadMe.txt

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ./build\_vx.sh

make: Nothing to be done for 'all'.

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ cd bin\_r\_cv4/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ls

detect\_demo\_x11 main.o

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ./detect\_demo\_x11 -h

./detect\_demo\_x11: option requires an argument -- 'h'

./detect\_demo\_x11 [-p picture path] [-w width] [-h height] [-m model type] [-f facenet flag] [-H]

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ./detect\_demo\_x11 -p ../1080p.bmp -m 0

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

E [vnn\_CreateYoloface:165]Open file nn\_data/yolo\_face\_88.nb failed.

E [model\_create:60]CHECK PTR 60

E Detect\_api:[det\_set\_model:225]Model\_create fail, file\_path=nn\_data, dev\_type=1

det\_set\_model fail. ret=-4

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ./detect\_demo\_x11 -p ../1080p.bmp -m 2

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

E [vnn\_CreateYolov3:165]Open file nn\_data/yolov3\_88.nb failed.

E [model\_create:61]CHECK PTR 61

E Detect\_api:[det\_set\_model:225]Model\_create fail, file\_path=nn\_data, dev\_type=1

det\_set\_model fail. ret=-4

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ls

detect\_demo\_x11 main.o

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ cd ..

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ls

1080p.bmp build\_vx.sh emb.db main.cpp makefile.linux.def nn\_detect\_common.h nn\_detect\_utils.h result

bin\_r\_cv4 detect.h linux\_build\_sample.log makefile.linux makefile.target\_name nn\_detect.h ReadMe.txt

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ cd ..

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library$ ls

inception model\_code sample\_demo\_fb sample\_demo\_x11 source\_code yolo\_demo\_fb\_mipi yolo\_demo\_fb\_usb yolo\_demo\_x11\_mipi yolo\_demo\_x11\_usb

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library$ cd source\_code/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/source\_code$ ls

bin\_r build\_vx.sh detect.c detect\_log.c include Makefile makefile.linux makefile.linux.def

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/source\_code$ ./build\_vx.sh

make: Nothing to be done for 'all'.

tee: /linux\_build\_sample.log: Permission denied

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/source\_code$ sudo ./build\_vx.sh

make: Nothing to be done for 'all'.

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/source\_code$ ls

bin\_r build\_vx.sh detect.c detect\_log.c include Makefile makefile.linux makefile.linux.def

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/source\_code$ ls bin\_r/

detect\_log.o detect.o libnn\_detect.so

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/source\_code$ cd ../sample\_demo\_x11/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ls

1080p.bmp build\_vx.sh emb.db main.cpp makefile.linux.def nn\_detect\_common.h nn\_detect\_utils.h result

bin\_r\_cv4 detect.h linux\_build\_sample.log makefile.linux makefile.target\_name nn\_detect.h ReadMe.txt

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ./build\_vx.sh

make: Nothing to be done for 'all'.

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ls bin\_r\_cv4/

detect\_demo\_x11 main.o

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ./detect\_demo\_x11 -p ../1080p.bmp -m 0

-bash: ./detect\_demo\_x11: No such file or directory

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ cd bin\_r\_cv4/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ./detect\_demo\_x11 -p ../1080p.bmp -m 0

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

E [vnn\_CreateYoloface:165]Open file nn\_data/yolo\_face\_88.nb failed.

E [model\_create:60]CHECK PTR 60

E Detect\_api:[det\_set\_model:225]Model\_create fail, file\_path=nn\_data, dev\_type=1

det\_set\_model fail. ret=-4

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$

### Another trial

khadas@Khadas-teco:~$ cd sajjad/

khadas@Khadas-teco:~/sajjad$ ls

applsource1 eachoptime eachoptime1 ksnn npu1 npusdk1

khadas@Khadas-teco:~/sajjad$ mkdir NPUApp

khadas@Khadas-teco:~/sajjad$ cd NPUApp/

khadas@Khadas-teco:~/sajjad/NPUApp$ sudo apt update

[sudo] password for khadas:

Hit:1 http://ports.ubuntu.com focal InRelease

Get:2 http://ports.ubuntu.com focal-security InRelease [114 kB]

Hit:3 http://deb.anydesk.com all InRelease

Get:4 http://ports.ubuntu.com focal-updates InRelease [114 kB]

Hit:5 https://linux.teamviewer.com/deb stable InRelease

Hit:6 http://dl.khadas.com/repos/vim3 focal InRelease

Get:7 http://ports.ubuntu.com focal-backports InRelease [108 kB]

Get:8 http://ports.ubuntu.com focal-security/main arm64 DEP-11 Metadata [40.7 kB]

Get:9 http://ports.ubuntu.com focal-security/universe arm64 DEP-11 Metadata [66.4 kB]

Get:10 http://ports.ubuntu.com focal-updates/main arm64 Packages [1,177 kB]

Get:11 http://ports.ubuntu.com focal-updates/main armhf Packages [979 kB]

Get:12 http://ports.ubuntu.com focal-updates/main arm64 DEP-11 Metadata [278 kB]

Get:13 http://ports.ubuntu.com focal-updates/universe arm64 Packages [866 kB]

Get:14 http://ports.ubuntu.com focal-updates/universe armhf Packages [758 kB]

Get:15 http://ports.ubuntu.com focal-updates/universe arm64 DEP-11 Metadata [390 kB]

Get:16 http://ports.ubuntu.com focal-backports/main arm64 DEP-11 Metadata [8,000 B]

Get:17 http://ports.ubuntu.com focal-backports/universe arm64 DEP-11 Metadata [30.8 kB]

Fetched 4,929 kB in 2s (2,022 kB/s)

Reading package lists... Done

Building dependency tree

Reading state information... Done

56 packages can be upgraded. Run 'apt list --upgradable' to see them.

N: Skipping acquire of configured file 'main/binary-arm64/Packages' as repository 'http://deb.anydesk.com all InRelease' doesn't s

khadas@Khadas-teco:~/sajjad/NPUApp$ sudo apt install libopencv-dev python3-opencv

Reading package lists... Done

Building dependency tree

Reading state information... Done

libopencv-dev is already the newest version (4.2.0+dfsg-5).

python3-opencv is already the newest version (4.2.0+dfsg-5).

The following packages were automatically installed and are no longer required:

libfwupdplugin1 libllvm11

Use 'sudo apt autoremove' to remove them.

0 upgraded, 0 newly installed, 0 to remove and 56 not upgraded.

khadas@Khadas-teco:~/sajjad/NPUApp$ git clone https://github.com/khadas/aml\_npu\_app

Cloning into 'aml\_npu\_app'...

remote: Enumerating objects: 1715, done.

remote: Counting objects: 100% (134/134), done.

remote: Compressing objects: 100% (54/54), done.

remote: Total 1715 (delta 68), reused 134 (delta 68), pack-reused 1581

Receiving objects: 100% (1715/1715), 1.00 GiB | 3.53 MiB/s, done.

Resolving deltas: 100% (975/975), done.

khadas@Khadas-teco:~/sajjad/NPUApp$ cd ..

khadas@Khadas-teco:~/sajjad$ cp -r NPUApp NPUApp1

khadas@Khadas-teco:~/sajjad$ cd NPUApp1/

khadas@Khadas-teco:~/sajjad/NPUApp1$ Source Description^C

khadas@Khadas-teco:~/sajjad/NPUApp1$ cd aml\_npu\_app/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app$ ls

DDK\_6.3.3.4 DDK\_6.4.0.3 DDK\_6.4.3 DDK\_6.4.4.3 detect\_library LICENSE NN\_SLT

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app$ ls detect\_library/

inception sample\_demo\_fb source\_code yolo\_demo\_fb\_usb yolo\_demo\_x11\_usb

model\_code sample\_demo\_x11 yolo\_demo\_fb\_mipi yolo\_demo\_x11\_mipi

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app$ ls detect\_library/model\_code

detect\_mtcnn detect\_yoloface detect\_yolo\_v2 detect\_yolo\_v3 detect\_yolo\_v3\_tiny detect\_yolo\_v4 facenet

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app$ ls detect\_library/source\_code/

build\_vx.sh detect.c detect\_log.c include Makefile makefile.linux makefile.linux.def

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app$ Library Description^C

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app$ ls detect\_library/model\_code

detect\_mtcnn detect\_yoloface detect\_yolo\_v2 detect\_yolo\_v3 detect\_yolo\_v3\_tiny detect\_yolo\_v4 facenet

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app$ ls detect\_library/model\_code/detect\_yolo\_v3

build\_vx.sh include makefile.linux makefile.linux.def makefile.target\_name vnn\_yolov3.c yolo\_v3.c yolov3\_process.c

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app$ Application Description^C

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app$ cd detect\_library/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library$ ls

inception sample\_demo\_fb source\_code yolo\_demo\_fb\_usb yolo\_demo\_x11\_usb

model\_code sample\_demo\_x11 yolo\_demo\_fb\_mipi yolo\_demo\_x11\_mipi

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library$ cd sample\_demo\_x11/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ls

1080p.bmp detect.h main.cpp makefile.linux.def nn\_detect\_common.h nn\_detect\_utils.h result

build\_vx.sh emb.db makefile.linux makefile.target\_name nn\_detect.h ReadMe.txt

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ Compile^C

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ Compile Library^C

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ cd ..

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library$ cd model\_code/detect\_yolo\_v3

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ ./build\_vx.sh

COMPILE /home/khadas/sajjad/NPUApp1/aml\_npu\_app/DDK\_6.3.3.4/detect\_library/model\_code/detect\_yolo\_v3/yolov3\_process.c

COMPILE /home/khadas/sajjad/NPUApp1/aml\_npu\_app/DDK\_6.3.3.4/detect\_library/model\_code/detect\_yolo\_v3/vnn\_yolov3.c

vnn\_yolov3.c: In function ‘vnn\_CreateYolov3’:

vnn\_yolov3.c:145:29: warning: unused variable ‘data’ [-Wunused-variable]

145 | uint8\_t \* data;

| ^~~~

At top level:

vnn\_yolov3.c:94:17: warning: ‘load\_data’ defined but not used [-Wunused-function]

94 | static uint8\_t\* load\_data

| ^~~~~~~~~

COMPILE /home/khadas/sajjad/NPUApp1/aml\_npu\_app/DDK\_6.3.3.4/detect\_library/model\_code/detect\_yolo\_v3/yolo\_v3.c

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ cd bin\_r/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/bin\_r$ ls

libnn\_yolo\_v3.so vnn\_yolov3.o yolo\_v3.o yolov3\_process.o

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/bin\_r$ Compile The Application^C

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/bin\_r$ cd ..

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ cd ..

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code$ cd ..

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library$ cd source\_code/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/source\_code$ ./build\_vx.sh

COMPILE /home/khadas/sajjad/NPUApp1/aml\_npu\_app/detect\_library/source\_code/detect\_log.c

COMPILE /home/khadas/sajjad/NPUApp1/aml\_npu\_app/detect\_library/source\_code/detect.c

detect.c:109:12: warning: ‘find\_string\_index’ defined but not used [-Wunused-function]

109 | static int find\_string\_index(char\* buffer, char\* str, int lenght)

| ^~~~~~~~~~~~~~~~~

tee: /linux\_build\_sample.log: Permission denied

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/source\_code$ sudo ./build\_vx.sh

[sudo] password for khadas:

make: Nothing to be done for 'all'.

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/source\_code$ ls bin\_r/

detect\_log.o detect.o libnn\_detect.so

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/source\_code$ Compile Application Demo^C

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/source\_code$ cd ../sample\_demo\_x11/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ./build\_vx.sh

COMPILE /home/khadas/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11/main.cpp

main.cpp: In function ‘int run\_detect\_model(int, char\*\*)’:

main.cpp:329:10: warning: converting to non-pointer type ‘int’ from NULL [-Wconversion-null]

329 | return NULL;

| ^~~~

main.cpp:275:39: warning: unused variable ‘img\_width’ [-Wunused-variable]

275 | int nn\_height, nn\_width, nn\_channel, img\_width, img\_height;

| ^~~~~~~~~

main.cpp:275:50: warning: unused variable ‘img\_height’ [-Wunused-variable]

275 | int nn\_height, nn\_width, nn\_channel, img\_width, img\_height;

| ^~~~~~~~~~

main.cpp: In function ‘int run\_detect\_facent(int, char\*\*)’:

main.cpp:412:10: warning: converting to non-pointer type ‘int’ from NULL [-Wconversion-null]

412 | return NULL;

| ^~~~

main.cpp:368:39: warning: unused variable ‘img\_width’ [-Wunused-variable]

368 | int nn\_height, nn\_width, nn\_channel, img\_width, img\_height;

| ^~~~~~~~~

main.cpp:368:50: warning: unused variable ‘img\_height’ [-Wunused-variable]

368 | int nn\_height, nn\_width, nn\_channel, img\_width, img\_height;

| ^~~~~~~~~~

main.cpp: In function ‘int init\_fb()’:

main.cpp:538:11: warning: unused variable ‘i’ [-Wunused-variable]

538 | long int i;

| ^

main.cpp: At global scope:

main.cpp:536:12: warning: ‘int init\_fb()’ defined but not used [-Wunused-function]

536 | static int init\_fb(void)

| ^~~~~~~

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ls bin\_r\_cv4/

detect\_demo\_x11 main.o

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ls

1080p.bmp detect.h main.cpp makefile.target\_name nn\_detect\_utils.h

bin\_r\_cv4 emb.db makefile.linux nn\_detect\_common.h ReadMe.txt

build\_vx.sh linux\_build\_sample.log makefile.linux.def nn\_detect.h result

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ bin\_r\_cv4/detect\_demo\_x11 -m 0 -p 1080p.bmp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

E [vnn\_CreateYoloface:165]Open file nn\_data/yolo\_face\_88.nb failed.

E [model\_create:60]CHECK PTR 60

E Detect\_api:[det\_set\_model:225]Model\_create fail, file\_path=nn\_data, dev\_type=1

det\_set\_model fail. ret=-4

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$

## Model Convert

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convert and call your own model through NPU

https://docs.khadas.com/linux/vim3/ConvertToUseNPU.html

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### DARKNET

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sajjad@teco:~/sajjad$ cp -r npusdk npusdk2

sajjad@teco:~/sajjad$ https://docs.khadas.com/linux/vim3/ConvertToUseNPU.html convert and call your own model through NPU^C

sajjad@teco:~/sajjad$ git clone https://github.com/pjreddie/darknet

Cloning into 'darknet'...

remote: Enumerating objects: 5946, done.

remote: Total 5946 (delta 0), reused 0 (delta 0), pack-reused 5946

Receiving objects: 100% (5946/5946), 6.37 MiB | 2.29 MiB/s, done.

Resolving deltas: 100% (3928/3928), done.

sajjad@teco:~/sajjad$ cd darknet/

sajjad@teco:~/sajjad/darknet$ make

mkdir -p obj

mkdir -p backup

mkdir -p results

gcc -Iinclude/ -Isrc/ -Wall -Wno-unused-result -Wno-unknown-pragmas -Wfatal-errors -fPIC -Ofast -c ./src/gemm.c -o obj/gemm.o

...

sajjad@teco:~/sajjad/darknet$ ls

backup data libdarknet.a LICENSE.fuck LICENSE.meta Makefile README.md src

cfg examples libdarknet.so LICENSE.gen LICENSE.mit obj results

darknet include LICENSE LICENSE.gpl LICENSE.v1 python scripts

sajjad@teco:~/sajjad/darknet$ wget https://pjreddie.com/media/files/yolov3.weights

--2022-04-15 17:15:56-- https://pjreddie.com/media/files/yolov3.weights

Resolving pjreddie.com (pjreddie.com)... 128.208.4.108

Connecting to pjreddie.com (pjreddie.com)|128.208.4.108|:443... connected.

HTTP request sent, awaiting response... 200 OK

Length: 248007048 (237M) [application/octet-stream]

Saving to: ‘yolov3.weights’

yolov3.weights 100%[===========================================>] 236,52M 19,0MB/s in 14s

2022-04-15 17:16:10 (17,2 MB/s) - ‘yolov3.weights’ saved [248007048/248007048]

sajjad@teco:~/sajjad/darknet$ Then run the detector!^C

sajjad@teco:~/sajjad/darknet$ ./da

darknet data/

sajjad@teco:~/sajjad/darknet$ ./darknet cfg/yolov3.cfg yolov3.weights data/dog.jpg

Not an option: cfg/yolov3.cfg

sajjad@teco:~/sajjad/darknet$ ./darknet detect cfg/yolov3.cfg yolov3.weights data/dog.jpg

layer filters size input output

0 conv 32 3 x 3 / 1 608 x 608 x 3 -> 608 x 608 x 32 0.639 BFLOPs

...

106 yolo

Loading weights from yolov3.weights...Done!

data/dog.jpg: Predicted in 12.520471 seconds.

dog: 100%

truck: 92%

bicycle: 99%

sajjad@teco:~/sajjad/darknet$ ls

backup data libdarknet.a LICENSE.fuck LICENSE.meta Makefile python scripts

cfg examples libdarknet.so LICENSE.gen LICENSE.mit obj README.md src

darknet include LICENSE LICENSE.gpl LICENSE.v1 predictions.jpg results yolov3.weights

sajjad@teco:~/sajjad/darknet$ eog predictions.jpg

sajjad@teco:~/sajjad/darknet$ ./darknet detect cfg/yolov3.cfg yolov3.weights data/

9k.labels dog.jpg imagenet.labels.list openimages.names

9k.names eagle.jpg imagenet.shortnames.list person.jpg

9k.tree giraffe.jpg inet9k.map scream.jpg

coco9k.map goal.txt kite.jpg voc.names

coco.names horses.jpg labels/

sajjad@teco:~/sajjad/darknet$ ./darknet detect cfg/yolov3.cfg yolov3.weights data/horses.jpg

layer filters size input output

0 conv 32 3 x 3 / 1 608 x 608 x 3 -> 608 x 608 x 32 0.639 BFLOPs

...

106 yolo

Loading weights from yolov3.weights...Done!

data/horses.jpg: Predicted in 12.806365 seconds.

horse: 100%

horse: 100%

horse: 96%

horse: 95%

sajjad@teco:~/sajjad/darknet$ eog predictions.jpg

sajjad@teco:~/sajjad/darknet$ ./darknet detector test cfg/coco.data yolov3.weights data/dog.jpg

Segmentation fault (core dumped)

sajjad@teco:~/sajjad/darknet$ ./darknet detector test cfg/coco.data cfg/yolov3.cfg yolov3.weights data/dog.jpg

layer filters size input output

0 conv 32 3 x 3 / 1 608 x 608 x 3 -> 608 x 608 x 32 0.639 BFLOPs

...

106 yolo

Loading weights from yolov3.weights...Done!

data/dog.jpg: Predicted in 12.178366 seconds.

dog: 100%

truck: 92%

bicycle: 99%

sajjad@teco:~/sajjad/darknet$

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### *Modify scripts 0\_import\_model.sh*

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sajjad@teco:~/sajjad/darknet$ Conversion^C

sajjad@teco:~/sajjad/darknet$ Modify 0\_import\_model.sh^C

sajjad@teco:~/sajjad/darknet$ cd ../npusdk2/aml\_npu\_sdk/acuity-toolkit/demo/

data/ model/

sajjad@teco:~/sajjad/darknet$ cd ../npusdk2/aml\_npu\_sdk/acuity-toolkit/

bin/ demo/ python/

sajjad@teco:~/sajjad/darknet$ cd ../npusdk2/aml\_npu\_sdk/acuity-toolkit/demo/

data/ model/

sajjad@teco:~/sajjad/darknet$ cd ../npusdk2/aml\_npu\_sdk/acuity-toolkit/demo/

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls

0\_import\_model.sh 1\_quantize\_model.sh 2\_export\_case\_code.sh data extractoutput.py inference.sh model

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ vim 0\_import\_model.sh

Traceback (most recent call last):

File "/usr/lib/command-not-found", line 28, in <module>

from CommandNotFound import CommandNotFound

File "/usr/lib/python3/dist-packages/CommandNotFound/CommandNotFound.py", line 19, in <module>

from CommandNotFound.db.db import SqliteDatabase

File "/usr/lib/python3/dist-packages/CommandNotFound/db/db.py", line 5, in <module>

import apt\_pkg

ModuleNotFoundError: No module named 'apt\_pkg'

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ sudo apt-get install vim

[sudo] password for sajjad:

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ vim 0\_import\_model.sh

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls ../bin/

acuitylib/ convertensorflow LICENSE setup.py VIPNANOQI\_PID0X7D

acuity.spec converter\_enter.py lstm\_caffe\_pb2.py tensorreduce VIPNANOQI\_PID0X88

build\_package.sh convertflite onnxruler/ tensorzonex VIPNANOQI\_PID0X99

caffe\_pb2.py convertkeras onnx\_ruler\_db.json tfruler/ VIPNANOQI\_PID0XA1

checkenv.py convertonnx ovxgenerator tf\_ruler\_db.json VIPNANOQI\_PID0XB9

client/ convertpytorch pegasus tools/ VIPNANOQI\_PID0XBE

convertcaffe exportflite pytorchirruler/ vcmdtools/ VIPNANOQI\_PID0XE8

convertdarknet .git README.md VERSION vxcode/

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ cd /home/sajjad/sajjad/darknet/

backup/ cfg/ data/ examples/ .git/ include/ obj/ python/ results/ scripts/ src/

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls /home/sajjad/sajjad/darknet/cfg/

alexnet.cfg densenet201.cfg openimages.data strided.cfg yolov2-tiny.cfg

cifar.cfg extraction22k.cfg resnet101.cfg t1.test.cfg yolov2-tiny-voc.cfg

cifar.test.cfg extraction.cfg resnet152.cfg tiny.cfg yolov2-voc.cfg

coco.data extraction.conv.cfg resnet18.cfg vgg-16.cfg yolov3.cfg

combine9k.data go.cfg resnet34.cfg vgg-conv.cfg yolov3-openimages.cfg

darknet19\_448.cfg go.test.cfg resnet50.cfg voc.data yolov3-spp.cfg

darknet19.cfg gru.cfg resnext101-32x4d.cfg writing.cfg yolov3-tiny.cfg

darknet53\_448.cfg imagenet1k.data resnext152-32x4d.cfg yolo9000.cfg yolov3-voc.cfg

darknet53.cfg imagenet22k.dataset resnext50.cfg yolov1.cfg

darknet9000.cfg imagenet9k.hierarchy.dataset rnn.cfg yolov1-tiny.cfg

darknet.cfg jnet-conv.cfg rnn.train.cfg yolov2.cfg

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls /home/sajjad/sajjad/darknet/

backup data libdarknet.a LICENSE.fuck LICENSE.meta Makefile python scripts

cfg examples libdarknet.so LICENSE.gen LICENSE.mit obj README.md src

darknet include LICENSE LICENSE.gpl LICENSE.v1 predictions.jpg results yolov3.weights

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ vim 0\_import\_model.sh

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ vim 1\_quantize\_model.sh

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ vim ./data/validation\_tf.txt

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls ./data/

0.jpg goldfish\_224.jpg space\_shuttle\_224.jpg validation\_tf.txt

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ vim 2\_export\_case\_code.sh

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls

0\_import\_model.sh 1\_quantize\_model.sh 2\_export\_case\_code.sh data extractoutput.py inference.sh model

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ bash 0\_import\_model.sh && bash 1\_quantize\_model.sh && bash 2\_export\_case\_code.sh

2022-04-15 17:44:09.300440: W tensorflow/stream\_executor/platform/default/dso\_loader.cc:59] Could not load dynamic library 'libcudart.so.10.1'; dlerror: libcudart.so.10.1: cannot open shared object file: No such file or directory; LD\_LIBRARY\_PATH: /home/sajjad/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/bin/acuitylib

2022-04-15 17:44:09.300463: I tensorflow/stream\_executor/cuda/cudart\_stub.cc:29] Ignore above cudart dlerror if you do not have a GPU set up on your machine.

I Start importing darknet...

I Convert -1 net

...

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

/home/sajjad/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo

/

/home/sajjad/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo\_nbg\_unify

I ----------------Error(0),Warning(0)----------------

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls

0\_import\_model.sh 2\_export\_case\_code.sh extractoutput.py model yolov3\_normal\_case\_demo

1\_quantize\_model.sh data inference.sh nbg\_unify\_yolov3

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls yolov3\_normal\_case\_demo/

BUILD makefile.linux vnn\_post\_process.c vnn\_pre\_process.c vnn\_yolov3.c yolov3.export.data

main.c vnn\_global.h vnn\_post\_process.h vnn\_pre\_process.h vnn\_yolov3.h yolov3.vcxproj

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls nbg\_unify\_yolov3/

BUILD makefile.linux vnn\_global.h vnn\_post\_process.h vnn\_pre\_process.h vnn\_yolov3.h yolov3.vcxproj

main.c nbg\_meta.json vnn\_post\_process.c vnn\_pre\_process.c vnn\_yolov3.c yolov3.nb

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ The converted code is in the nbg\_unify\_yolov3 directory^C

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls nbg\_unify\_yolov3/

BUILD makefile.linux vnn\_global.h vnn\_post\_process.h vnn\_pre\_process.h vnn\_yolov3.h yolov3.vcxproj

main.c nbg\_meta.json vnn\_post\_process.c vnn\_pre\_process.c vnn\_yolov3.c yolov3.nb

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls /home/sajjad/sajjad/

darknet/ NPUPrebuiltUsage/ npusdk/ npusdk1/ npusdk2/

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ ls /home/sajjad/sajjad/

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### Replace VNN File from PC to Khadas

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Copy the files on the khadas board using USB

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### *continued on khadas*

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khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ cd ../model\_code/detect\_yolo\_v3

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ ./build\_vx.sh

make: Nothing to be done for 'all'.

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ ls

bin\_r include makefile.linux makefile.target\_name yolo\_v3.c

build\_vx.sh linux\_build\_sample.log makefile.linux.def vnn\_yolov3.c yolov3\_process.c

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ cd include/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/include$ scp sajjad@10.10.254.220:sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo/nbg\_unify\_yolov3/vnn\_yolov3.h .

ssh: connect to host 10.10.254.220 port 22: Network is unreachable

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/include$ vim yolov3\_process.h

nn\_detect\_common.h nn\_detect\_utils.h vnn\_post\_process.h vnn\_yolov3.h yolov3\_process.h

nn\_detect.h vnn\_global.h vnn\_pre\_process.h yolo\_v3.h

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/include$ vim yolov3\_process.h

nn\_detect\_common.h nn\_detect\_utils.h vnn\_post\_process.h vnn\_yolov3.h yolov3\_process.h

nn\_detect.h vnn\_global.h vnn\_pre\_process.h yolo\_v3.h

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/include$ cd ..

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ vim yolov3\_process.c

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ vim yolov3\_process.c

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ ./build\_vx.sh

COMPILE /home/khadas/sajjad/NPUApp1/aml\_npu\_app/DDK\_6.3.3.4/detect\_library/model\_code/detect\_yolo\_v3/vnn\_yolov3.c

vnn\_yolov3.c: In function ‘vnn\_CreateYolov3’:

vnn\_yolov3.c:146:29: warning: unused variable ‘data’ [-Wunused-variable]

146 | uint8\_t \* data;

| ^~~~

At top level:

vnn\_yolov3.c:94:17: warning: ‘load\_data’ defined but not used [-Wunused-function]

94 | static uint8\_t\* load\_data

| ^~~~~~~~~

make: Nothing to be done for 'all'.

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ ls

bin\_r include makefile.linux makefile.target\_name yolo\_v3.c

build\_vx.sh linux\_build\_sample.log makefile.linux.def vnn\_yolov3.c yolov3\_process.c

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ cd

khadas@Khadas-teco:~$ cd sajjad/

applsource1/ eachoptime/ eachoptime1/ ksnn/ npu1/ NPUApp/ NPUApp1/ npusdk1/

khadas@Khadas-teco:~$ cd sajjad/applsource1/aml\_npu\_app/

DDK\_6.3.3.4/ DDK\_6.4.0.3/ DDK\_6.4.3/ DDK\_6.4.4.3/ detect\_library/ .git/ NN\_SLT/

khadas@Khadas-teco:~$ cd sajjad/applsource1/aml\_npu\_app/detect\_library/

inception/ sample\_demo\_fb/ source\_code/ yolo\_demo\_fb\_usb/ yolo\_demo\_x11\_usb/

model\_code/ sample\_demo\_x11/ yolo\_demo\_fb\_mipi/ yolo\_demo\_x11\_mipi/

khadas@Khadas-teco:~$ cd sajjad/

applsource1/ eachoptime/ eachoptime1/ ksnn/ npu1/ NPUApp/ NPUApp1/ npusdk1/

khadas@Khadas-teco:~$ cd sajjad/applsource1/aml\_npu\_app/detect\_library/

inception/ sample\_demo\_fb/ source\_code/ yolo\_demo\_fb\_usb/ yolo\_demo\_x11\_usb/

model\_code/ sample\_demo\_x11/ yolo\_demo\_fb\_mipi/ yolo\_demo\_x11\_mipi/

khadas@Khadas-teco:~$ cd sajjad/applsource1/aml\_npu\_app/detect\_library/

inception/ sample\_demo\_fb/ source\_code/ yolo\_demo\_fb\_usb/ yolo\_demo\_x11\_usb/

model\_code/ sample\_demo\_x11/ yolo\_demo\_fb\_mipi/ yolo\_demo\_x11\_mipi/

khadas@Khadas-teco:~$ cd sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ls

1080p.bmp detect.h main.cpp makefile.target\_name nn\_detect\_utils.h

bin\_r\_cv4 emb.db makefile.linux nn\_detect\_common.h ReadMe.txt

build\_vx.sh linux\_build\_sample.log makefile.linux.def nn\_detect.h result

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ cd bin\_r\_cv4/

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ls

detect\_demo\_x11 main.o

khadas@Khadas-teco:~/sajjad/applsource1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ cd

khadas@Khadas-teco:~$ ls

aml\_npu\_sdk Documents Music Pictures Templates

'copy\_to\_board executing on ksnn khadas.log' Downloads my\_video-1.mkv Public venv

Desktop ksnn nn sajjad Videos

khadas@Khadas-teco:~$ cd sajjad/

khadas@Khadas-teco:~/sajjad$ ls

applsource1 eachoptime eachoptime1 ksnn npu1 NPUApp NPUApp1 npusdk1

khadas@Khadas-teco:~/sajjad$ cd NPUApp1/aml\_npu\_app/

DDK\_6.3.3.4/ DDK\_6.4.0.3/ DDK\_6.4.3/ DDK\_6.4.4.3/ detect\_library/ .git/ NN\_SLT/

khadas@Khadas-teco:~/sajjad$ cd NPUApp1/aml\_npu\_app/

DDK\_6.3.3.4/ DDK\_6.4.0.3/ DDK\_6.4.3/ DDK\_6.4.4.3/ detect\_library/ .git/ NN\_SLT/

khadas@Khadas-teco:~/sajjad$ cd NPUApp1/aml\_npu\_app/detect\_library/

inception/ sample\_demo\_fb/ source\_code/ yolo\_demo\_fb\_usb/ yolo\_demo\_x11\_usb/

model\_code/ sample\_demo\_x11/ yolo\_demo\_fb\_mipi/ yolo\_demo\_x11\_mipi/

khadas@Khadas-teco:~/sajjad$ cd NPUApp1/aml\_npu\_app/detect\_library/

inception/ sample\_demo\_fb/ source\_code/ yolo\_demo\_fb\_usb/ yolo\_demo\_x11\_usb/

model\_code/ sample\_demo\_x11/ yolo\_demo\_fb\_mipi/ yolo\_demo\_x11\_mipi/

khadas@Khadas-teco:~/sajjad$ cd npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ls nn\_data/

yolo\_face\_88.nb yolotiny\_88.nb yolov2\_88.nb yolov3\_88.nb yolov3\_99.nb yolov4\_99.nb

yolo\_face\_99.nb yolotiny\_99.nb yolov2\_99.nb yolov3\_88\_original.nb yolov4\_88.nb

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ls

1080p1.bmp 2a.jpg 4a.jpg 6.jpg eagle.jpg IMG\_20220322\_143214.jpg output.bmp

1080p.bmp 2.jpg 4.jpg detect\_demo\_fb giraffe1.jpg INSTALL person.jpg

1a.jpg 3a.jpg 5a.jpg detect\_demo\_x11 giraffe.bmp lib README.md

1.jpg 3.jpg 5.jpg dog.jpg giraffe.jpg nn\_data UNINSTALL

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ls lib

libnn\_detect.so libnn\_yoloface.so libnn\_yolo\_v2.so libnn\_yolo\_v4.so

libnn\_facenet.so libnn\_yolo\_tiny.so libnn\_yolo\_v3.so

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ls /home/khadas/sajjad/NPUApp

NPUApp/ NPUApp1/

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ls /home/khadas/sajjad/NPUApp1/aml\_npu\_app/detect\_library/source\_code/

bin\_r/ detect.c include/ makefile.linux

build\_vx.sh detect\_log.c Makefile makefile.linux.def

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ ls /home/khadas/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/

detect\_mtcnn/ detect\_yolo\_v2/ detect\_yolo\_v3\_tiny/ facenet/

detect\_yoloface/ detect\_yolo\_v3/ detect\_yolo\_v4/

khadas@Khadas-teco:~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture$ cd /home/khadas/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ ls

bin\_r include makefile.linux makefile.target\_name yolo\_v3.c

build\_vx.sh linux\_build\_sample.log makefile.linux.def vnn\_yolov3.c yolov3\_process.c

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ cd bin\_r/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/bin\_r$ ls

libnn\_yolo\_v3.so vnn\_yolov3.o yolo\_v3.o yolov3\_process.o

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/bin\_r$ cd ../

bin\_r/ include/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/bin\_r$ cd ../../

detect\_mtcnn/ detect\_yolo\_v2/ detect\_yolo\_v3\_tiny/ facenet/

detect\_yoloface/ detect\_yolo\_v3/ detect\_yolo\_v4/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3/bin\_r$ cd ..

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code/detect\_yolo\_v3$ cd ..

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/model\_code$ cd ..

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library$ ls

inception sample\_demo\_fb source\_code yolo\_demo\_fb\_usb yolo\_demo\_x11\_usb

model\_code sample\_demo\_x11 yolo\_demo\_fb\_mipi yolo\_demo\_x11\_mipi

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library$ cd sample\_demo\_x11/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ ls

1080p.bmp detect.h main.cpp makefile.target\_name nn\_detect\_utils.h

bin\_r\_cv4 emb.db makefile.linux nn\_detect\_common.h ReadMe.txt

build\_vx.sh linux\_build\_sample.log makefile.linux.def nn\_detect.h result

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11$ cd bin\_r\_cv4/

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ls

detect\_demo\_x11 main.o

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ cp -r ~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture/lib .

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ cp -r ~/sajjad/npu1/aml\_npu\_demo\_binaries/detect\_demo\_picture/nn\_data .

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ls

detect\_demo\_x11 lib main.o nn\_data

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$ ./detect\_demo\_x11 -m 0 -p ../1080p.bmp

W Detect\_api:[det\_set\_log\_level:19]Set log level=1

W Detect\_api:[det\_set\_log\_level:21]output\_format not support Imperfect, default to DET\_LOG\_TERMINAL

W Detect\_api:[det\_set\_log\_level:26]Not exist VSI\_NN\_LOG\_LEVEL, Setenv set\_vsi\_log\_error\_level

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=1

result type is 2

i:1 left:967.347 right:1266.4 top:63.3736 bottom:518.165

khadas@Khadas-teco:~/sajjad/NPUApp1/aml\_npu\_app/detect\_library/sample\_demo\_x11/bin\_r\_cv4$

## NPU Performance

## NPU Operation Usage Times

With the CNN\_DUMP\_FILE=1, different files are produced in the bin\_rc4. By investigations it seems that the number of rows in each file has some correspondence in the respective layers mentioned in the graph.json.

***File Entries Calculations Reference in graph.json***

150528 2242x224x3 "output\_shape": [ [ 224, 224, 3, 1 ] ]

401408 112x112x32 "output\_shape": [ [ 112, 112, 32, 1 ] ]

401408 112x112x32 "output\_shape": [ [ 112, 112, 32, 1 ] ]

802816 112x112x64 "output\_shape": [ [ 112, 112, 64, 1 ] ]

200704 56x56x64 "output\_shape": [ [ 56, 56, 64, 1 ] ]

401408 56x56x128 "output\_shape": [ [ 56, 56, 128, 1 ] ]

401408 56x56x128 "output\_shape": [ [ 56, 56, 128, 1 ] ]

401408 56x56x128 "output\_shape": [ [ 56, 56, 128, 1 ] ]

100352 28x28x128 "output\_shape": [ [ 28, 28, 128, 1 ] ]

200704 28x28x256 "output\_shape": [ [ 28, 28, 256, 1 ] ]

200704 28x28x256 "output\_shape": [ [ 28, 28, 256, 1 ] ]

## Tengine SDK

## Tengine Demo

## KSNN(Python API)

### KSNN Usage

### KSNN Convert tool

### KSNN API

1. **Example to get own network running on khadas board (WINDOWS DOCKER)**

## Installing Docker

### Torch error

On windows I had Python 3.9 and therefore could not install the requirement.txt (1\_create\_and\_export\_network) packages especially Torch. After some google and exploration found that Python 3.8.5 is the suitable for installations. And it works.

## Execution on Windows 10

### 1\_create\_and\_export\_network

How to run:

1. I use python3.8.5 64bit, tested on windows 10
2. Initialize virtual env: ***python -m virtualenv venv***
3. Activate in virtual env. windows: ***venv\Scripts\activate.bat***
4. Install requirements in virtual environment: ***pip install -r requirements.txt***
5. NOTE: if you want to have pyTorch with CUDA use requirements\_cuda.txt: ***pip install -r requirements\_cuda.txt***
6. create link to install venv kernel: ***python -m ipykernel install --user --name py39-teconet***
7. Install jupyter on Windows 10
8. Run jupyter notebook: ***jupyter notebook***
9. In jupyter open the file " pytorch\_to\_khadas\_TECO\_example.ipynb"
10. In jupyter after opening select the correct kernel under Kernel->Change Kernel->py39-teconet

Output:

1. It produces: lenet.onnx file.

### 2\_convert\_network

Prerequisites:

1. Install docker
2. make sure you have the following files in the folder "*network*"
   1. lenet.onnx
   2. convert-lenet-onnx-to-khadas.sh
3. make sure you have an empty outputs directory

Run the conversion process:

1. open the command terminal, go to the path 2\_convert\_network and use the following command (Windows 10)
2. run: ***convert.bat***
3. or you can directly run the docker file: ***docker run --rm --name conv-test -it --mount type=bind,source=D:\Downloads\novelsense\example-network\2\_convert\_network\data,target=/acuity-toolkit/python/data --mount type=bind,source=D:\Downloads\novelsense\example-network\2\_convert\_network\network,target=/acuity-toolkit/python/network --mount type=bind,source=D:\Downloads\novelsense\example-network\2\_convert\_network\outputs,target=/acuity-toolkit/python/outputs --entrypoint=/acuity-toolkit/python/network/convert-lenet-onnx-to-khadas.sh ghcr.io/scholz/aml-container:0.0.1***
4. or you can directly run the docker file to open the shell bash and then run the script in the docker: ***docker run --rm --name conv-test -it --mount type=bind,source=D:\Downloads\novelsense\example-network\2\_convert\_network\data,target=/acuity-toolkit/python/data --mount type=bind,source=D:\Downloads\novelsense\example-network\2\_convert\_network\network,target=/acuity-toolkit/python/network --mount type=bind,source=D:\Downloads\novelsense\example-network\2\_convert\_network\outputs,target=/acuity-toolkit/python/outputs --entrypoint=/bin/bash ghcr.io/scholz/aml-container:0.0.1***
5. and then run: ***convert-lenet-onnx-to-khadas***

Output:

1. It gives error on Windows 10 in all these different ways:

--+ KSNN Convert tools v1.2 +--

Start import model ...

Illegal instruction

1. Or

root@668e39b4dce1:/acuity-toolkit/demo# CONVERT\_PATH="/acuity-toolkit/python/"

root@668e39b4dce1:/acuity-toolkit/demo# cd $CONVERT\_PATH/

root@668e39b4dce1:/acuity-toolkit/python# ./convert --model-name lenet --platform onnx --outputs "output" --inputs "input" --input-size-list '28,28,3' --model ./network/lenet.onnx --mean-values '127.5,127.5,127.5,255.0' --quantized-dtype

asymmetric\_affine --qtype int16 --kboard VIM3 --print-level 1

--+ KSNN Convert tools v1.2 +--

Start import model ...

Illegal instruction

Output:

1. If the conversion was successful the output should be in outputs/lenet:
   1. lenet.nb
   2. libnn\_lenet.so
2. These two files must now be copied over to the Khadas board to test the functionality. See in the next step.
3. But in my case there was not such file produced as the docker produces “Illegal instruction” error.

### 3\_run\_network

Prepare:

1. copy the lenet.nb and libnn\_lenet.so from the previous step to the folder **copy\_to\_board**
2. if not done already: install ksnn on the khadas board, ie. ***git clone https://github.com/khadas/ksnn***
3. ***pip3 install ksnn/ksnn-1.2-py3-none-any.whl***
4. transfer the folder "copy\_to\_board" to the khadas board

Run the network:

1. ssh into the khadas board
2. cd to the "***copy\_to\_board***" folder
3. run bash lenet\_simple.sh
4. **Example to get own network running on khadas board (WINDOWS UBUNTU)**
5. installing docker
6. Followed the same steps and here it is working properly.

--+ KSNN Convert tools v1.2 +--

Start import model ...

….

…

….

I ----------------Error(0),Warning(0)----------------

Done.Quantize success !!!

Start export model ...

Done.Export model success !!!

Start generate library...

Done.Generate library success !!!

All Done.

root@49279c91386e:/acuity-toolkit/python# ls outputs/

lenet

root@49279c91386e:/acuity-toolkit/python# ls outputs/lenet/

lenet.nb libnn\_lenet.so

root@49279c91386e:/acuity-toolkit/python# ls outputs/lenet/

root@49279c91386e:/acuity-toolkit/python# ll

total 412872

drwxr-xr-x 1 root root 4096 Apr 14 06:52 ./

drwxr-xr-x 1 root root 4096 Apr 14 06:52 ../

-rwxr-xr-x 1 root root 422744304 Apr 7 08:21 convert\*

drwxrwxr-x 3 1000 1000 4096 Apr 7 12:41 data/

-rw-r--r-- 1 root root 8 Apr 7 08:21 .gitignore

drwxrwxr-x 2 1000 1000 4096 Apr 11 04:07 network/

drwxrwxr-x 3 1000 1000 4096 Apr 14 06:52 outputs/

root@49279c91386e:/acuity-toolkit/python# ll outputs/lenet/

1. trying to run onnx example using the conversion script instead of python script, but gives the error as could not find the. quantize file

## Khadas Forum Questions

### Mine

#### Error in operation wise usage times

<https://forum.khadas.com/t/error-in-operation-wise-usage-times/14386/47>

#### Can’t reproduce extra many files were generated while executing "each operation times usage"

<https://forum.khadas.com/t/cant-reproduce-extra-many-files-were-generated-while-executing-each-operation-times-usage/15066>

#### Contents of different files generated bin\_r\_cv4 while export NN\_LAYER\_DUMP=1

<https://forum.khadas.com/t/contents-of-different-files-generated-bin-r-cv4-while-export-nn-layer-dump-1/15267>

#### Training aware quantization or bypass the quantization while executing 1\_quantize\_model.sh

<https://forum.khadas.com/t/training-aware-quantization-or-bypass-the-quanitization-while-executing-1-quantize-model-sh/15268>

#### Using convert scripts for lenet onnx model

<https://forum.khadas.com/t/using-convert-scripts-for-lenet-onnx-model/15513>

#### Parameter fl meaning in. quantize file

<https://forum.khadas.com/t/parameter-fl-meaning-in-quantize-file/15589>

#### Converting official yolov3 give wrong results

<https://forum.khadas.com/t/converting-official-yolov3-give-wrong-results/15546>

#### Converting official yolov3 give wrong results

<https://forum.khadas.com/t/converting-official-yolov3-give-wrong-results/15546/3>

### Others

#### Yolo\_V3 image input size for detection

<https://forum.khadas.com/t/yolo-v3-image-input-size-for-detection/15851>

#### Example fails when the input isn’t 1080p

<https://forum.khadas.com/t/yolov4-example-fails-when-the-input-isnt-1080p/14828/3>

### Articles:

#### Introduction into YOLO v3

<https://www.youtube.com/watch?v=vRqSO6RsptU&t=1447s>

#### Hardware-Oriented Approximation of Convolutional Neural Networks

<https://blog.csdn.net/qq_19784349/article/details/82758137>

## YOLO-V3 Generating NB file and Execution

### Could not Run Yolo-v3 with the already installed Khadas Image and existing SDK Conversion – did not work

### Tried with 6.4.6.2 SDK Version also – did not work

### Tried with most recent SDK – did not work

### Installed new khadas VIM3 image

### Tried with existing SDK – did not work

### Tried with 6.4.6.2 SDK Version also – did not work

### Tried with most recent SDK – did not work

### Got another cfg and weights for Yolo-v3 from the @Frank

### Tried with existing SDK – did not work

### Tried with 6.4.6.2 SDK Version also – did not work

### Tried with most recent SDK – worked but did not detect properly

### Changed the channel mean value parameters, as recommended by @Frank

### Tried with existing SDK – did not work

### Tried with 6.4.6.2 SDK Version also – did not work

### Tried with most recent SDK – worked but did not detect for some pictures

### Tried to change the picture sizes and types – did not work

### Then found that the size should be multiple of 32, changed the picture size accordingly, then, it works.

### Tried on the recent SDK on the previous VIM3 Image, it worked fine then.

## Standalone Yolo-v3 Code

Using detect\_demo\_x11, need following steps earlier:

* Should have libnn\_detect.so from source\_code folder
* Generate export files and .nb file and copy them to relevant directories.
* Should have libnn\_yolo\_V3.so from the detect\_yolo\_v3 folder
* Copy libnn\_yolo\_v3.so and .nd to demo\_detect\_picture folder and do ./INSTALL

Now:

* Just copy export files and .nb file into the new stand-alone folder and compile it, and use it.

For this, I did the following:

* Modified some of the c files
* Changed the Makefile to work successfully
* Used build.sh to compile the code

# Tried with the code converted from existing SDK

# Tried with the code converted from 6.4.6.2 SDK

# Tried with the code converted from recent SDK – worked

# Summary Till 17.06.2022

## Novelsense Khadas Repository

Add the folders:

* Docs: logs and documentation
* Nbg: model converted sdk code form scripts
* Nopnet: testing, profiling and executing nopnet (an example) network
* Standalone: yolov3 without .so files

### Nopnet Folder

* Testing Markus NOPNET example
* Adapted the changes from Markus to compare and print
* Used recent SDK on both newer and older Khadas Image (SD Card)
* worked for minimal and Markus adapted application
* did profiling for the both (see the execution log)
  1. 3\_compile\_and\_run\_using\_c\_code1: adapted the changed in the minimal nbg code
  2. op\_test\_nopnet: profiling for minimal nbg code
  3. op\_test\_nopnet\_adapted: profiling for adapted the changed in the minimal nbg code

### NBG Folder

* This is the code produced from SDK.
* Used the recent SDK with newer Khadas image
* Modified Makefile to compile it with build\_vx.sh

#### nbg\_unify\_yolov3

* minimal example using the old conversion scripts
* khadas@Khadas-teco:~/sajjad/minimal\_nn\_example/nbg\_unify\_yolov3$ ./bin\_r\_cv4/yolov3test ./yolov3.nb 1080p-608x608.jpg

#### nbg\_unify\_lenet

* minimal example using the old conversion scripts
* khadas@Khadas-teco:~/sajjad/minimal\_nn\_example/nbg\_unify\_lenet$ ./bin\_r\_cv4/lenettest ./lenet.nb ./bmp/1.jpg

#### yolov3\_nbg\_unify\_608\_hussainA

* yolov3\_nbg\_unify minimal example using the new conversion scripts
* darknet cfg and weights are used from the website
* khadas@Khadas-teco:~/sajjad/minimal\_nn\_example/yolov3\_nbg\_unify\_608\_hussainA/bin\_r\_cv4$ ./yolov3test ../yolov3\_88.nb ../1080p-608x608.jpg Create Neural Network: 2428ms or 2428619us Verify... Verify Graph: 11ms or 11375us Start run graph [1] times... Run the 1 time: 339.00ms or 339429.00us vxProcessGraph execution time: Total 339.00ms or 339496.00us Average 339.50ms or 339496.00us --- Top5 --- 32638: 524288.000000 1549: 491520.000000 1763: 491520.000000 50779: 491520.000000 1742: 483328.000000

#### yolov3\_nbg\_unify\_416\_hussainA

* yolov3\_nbg\_unify minimal example using the new conversion scripts
* darknet cfg and weights are recommended by Frank (Khadas Community)

### Standalone Folder

#### Standalone Yolo-v3 Code

* Using detect\_demo\_x11, need following steps earlier:
  1. Should have libnn\_detect.so from source\_code folder
  2. Generate export files and .nb file and copy them to relevant directories.
  3. Should have libnn\_yolo\_V3.so from the detect\_yolo\_v3 folder
  4. Copy libnn\_yolo\_v3.so and .nd to demo\_detect\_picture folder and do ./INSTALL
* Now:
  1. Just copy export files and .nb file into the new stand-alone folder and compile it, and use it.
* For this, I did the following:
  1. Modified some of the c files
  2. Changed the Makefile to work successfully
  3. Used build.sh to compile the code
  4. Quick summary Avoiding libnn\_yolo\_v3.so and libnn\_detect.so combining the code from: detect\_yolo\_v3 (libnn\_yolo\_v3.so), source\_code (code for libnn\_detect.so) , and sample\_demo\_x11 (actual code for detection)
  5. sample\_demo\_x11B/bin\_r\_cv4$ ./detect\_demo\_x11 -m 2 -p ../1080p.bmp
  6. images are saved in the img folder for different sizes
  7. we can use -w 416 -h 416 paramters for lesser sizes.

# Meeting 12-07-2022

yolov3 profiling

-minimal original works

-minimal adapted with detection, generated results, i am not sure (with yolov3\_88.nb)

-minimal adapted with detection, generated results, i am not sure (with yolov3\_export.data)

Yolov3-tniy:

-as per the documentation of yolov3, gives segmentation fault.

-then generated own standalone yolov3-tiny as i did for yolov3

-that works, lesser detection results

diff and patches:

Standalone:

-yolov3

-yolov3-tiny

dif and patches:

minimal that works and generates test application from the SDK converted code

-yolov3

-yolov3-tiny

dif and patches:

minimal that works+detection and generates test application from the SDK converted code

-yolov3

-yolov3-tiny

Cfg Conflicts:

-608 does not works

-the same file when changed to 416, works

-asked community, did not solve

# 25.07.2022 cfg 608 problem, Execution of mobilenet and profiling

## Cfg 608

### Fixing the error in sample\_demo\_x11\_yolov3 while using the converted model from 608 cfg

Search "608" (4 hits in 1 file of 8 searched)

D:\Downloads\23July\yolov3\_nbg\_unify\_608\_hussainA\vnn\_yolov3.c (4 hits)

Line 219: input - [608, 608, 3, 1]

Line 219: input - [608, 608, 3, 1]

Line 242: attr.size[0] = 608;

Line 243: attr.size[1] = 608;

-----------------

Search "416" (4 hits in 1 file of 8 searched)

D:\Downloads\23July\yolov3\_nbg\_unify\_416\_hussainA\vnn\_yolov3.c (4 hits)

Line 219: input - [416, 416, 3, 1]

Line 219: input - [416, 416, 3, 1]

Line 242: attr.size[0] = 416;

Line 243: attr.size[1] = 416;

-----------------

Search "416" (6 hits in 2 files of 14 searched)

D:\Downloads\sample\_demo\_x11\_yolov3\main.cpp (2 hits)

Line 125: amlge2d.ge2dinfo.dst\_info.canvas\_w = 416;

Line 126: amlge2d.ge2dinfo.dst\_info.canvas\_h = 416;

D:\Downloads\sample\_demo\_x11\_yolov3\vnn\_yolov3.c (4 hits)

Line 219: input - [416, 416, 3, 1]

Line 219: input - [416, 416, 3, 1]

Line 242: attr.size[0] = 416;

Line 243: attr.size[1] = 416;

-----------------

Changed 416 to 608 in main.cpp:

Line 125: amlge2d.ge2dinfo.dst\_info.canvas\_w = 608;//416;

Line 126: amlge2d.ge2dinfo.dst\_info.canvas\_h = 608;//416;

### Fixing the error in minimal yolov3 while using the converted model from 608 cfg

khadas@Khadas:~$ cd hussain/minimal\_first\_working/

khadas@Khadas:~/hussain/minimal\_first\_working$ mkdir yolov3\_nbg\_unify\_608\_hussainA

khadas@Khadas:~/hussain/minimal\_first\_working$ cp -r yolov3\_nbg\_unify\_416\_hussainBR1/\* yolov3\_nbg\_unify\_608\_hussainA/.

khadas@Khadas:~/hussain/minimal\_first\_working$ cd yolov3\_nbg\_unify\_608\_hussainA/

khadas@Khadas:~/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA$ copied recommended c,h and nb file^C

khadas@Khadas:~/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA$ vim vnn\_yolov3.c

khadas@Khadas:~/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA$ ./build\_vx.sh

COMPILE /home/khadas/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA/yolov3\_process.c

COMPILE /home/khadas/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA/vnn\_pre\_process.c

COMPILE /home/khadas/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA/vnn\_yolov3.c

vnn\_yolov3.c: In function ‘vnn\_CreateYolov3’:

vnn\_yolov3.c:146:29: warning: unused variable ‘data’ [-Wunused-variable]

146 | uint8\_t \* data;

| ^~~~

At top level:

vnn\_yolov3.c:94:17: warning: ‘load\_data’ defined but not used [-Wunused-function]

94 | static uint8\_t\* load\_data

| ^~~~~~~~~

COMPILE /home/khadas/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA/main.c

COMPILE /home/khadas/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA/vnn\_post\_process.c

make: Nothing to be done for 'all'.

khadas@Khadas:~/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA$ ls bin\_r\_cv4/

khadas@Khadas:~/hussain/minimal\_first\_working/yolov3\_nbg\_unify\_608\_hussainA$ ./bin\_r\_cv4/yolov3test yolov3\_88.nb ~/hussain/img/608/person\_608.jpg

Create Neural Network: 87ms or 87841us

model.width:608 model.height:608 model.channel:3

>>>>>>>>>>><<<<<<<<<<<<<<

Draw rectangle for 3 detections of person\_416.jpg

>>>>>>>>>>><<<<<<<<<<<<<<

Verify...

Verify Graph: 12ms or 12131us

Start run graph [1] times...

Run the 1 time: 189.00ms or 189174.00us

vxProcessGraph execution time:

Total 189.00ms or 189231.00us

Average 189.23ms or 189231.00us

--- Top5 ---

32686: 11.250000

32687: 9.250000

32705: 8.750000

38832: 8.750000

32325: 8.250000

>>>>>>>>>>><<<<<<<<<<<<<<

>>The Detection Classes<<

>>>>>>>>>>><<<<<<<<<<<<<<

No.0: Names and Prob: person, 100%

left=0.300029,top=0.214368,right=0.421229,bot=0.903786

No.1: Names and Prob: horse, 100%

left=0.621584,top=0.300886,right=0.951038,bot=0.837806

No.2: Names and Prob: dog, 100%

left=0.118294,top=0.624922,right=0.309084,bot=0.814992

done!

## Reinstalling the VIM3 and SDK

Debugging the old SD Card and SDK and reinstalling it, which then works, basically I revert back to this to check the old profiling results.

### Khadas old sdcard

1. OS Version

khadas@Khadas-teco:~/hussain/sample\_demo\_x11\_yolov3/bin\_r\_cv4$ uname -a

Linux Khadas-teco 4.9.241 #739 SMP PREEMPT Fri Apr 29 10:15:28 CST 2022 aarch64 aarch64 aarch64 GNU/Linux

1. Using NPU SDK Version

<https://github.com/khadas/aml_npu_sdk> 6.4.8.7

### Ubuntu Teco PC

1. OS Version

sajjad@teco:~/sajjad/npusdk2/aml\_npu\_sdk/acuity-toolkit/demo$ uname -a

Linux teco 5.4.0-107-generic #121~18.04.1-Ubuntu SMP Thu Mar 24 17:21:33 UTC 2022 x86\_64 x86\_64 x86\_64 GNU/Linux

1. Using NPU SDK Version

Folder: ~/sajjad/npusdk2 <https://github.com/khadas/aml_npu_sdk> 6.4.6.2

Folder: ~/hussain/npusdk2\_basis <https://github.com/khadas/aml_npu_sdk> 6.4.8.7

### Khadas new sdcard

1. OS Version

khadas@Khadas:~$ uname -a

Linux Khadas 4.9.241 #739 SMP PREEMPT Fri Apr 29 10:15:28 CST 2022 aarch64 aarch64 aarch64 GNU/Linux

khadas@Khadas:~$

1. Using NPU SDK Version

<https://github.com/khadas/aml_npu_sdk> 6.4.8.7

### after reinstalling old sdcard

1. OS Version

khadas@Khadas:~$ uname -a

Linux Khadas 4.9.241 #24 SMP PREEMPT Fri Dec 17 17:42:23 CST 2021 aarch64 aarch64 aarch64 GNU/Linux

khadas@Khadas:~$

1. Using NPU SDK Version

<https://github.com/khadas/aml_npu_sdk> 6.4.6.2

Steps:

1. installed VIM3\_Ubuntu-gnome-focal\_Linux-4.9\_arm64\_SD-USB\_V1.0.9-211217.img
2. don’t update the khadas image using https://docs.khadas.com/linux/vim3/UpgradeSystem.html
3. installed updates sudo apt-get update
4. installed openvcv
5. sudo apt install libopencv-dev python3-opencv
6. copied the files from nbg\_unify\_yolov3\_sajjad\_416
7. compiled=OK
8. detections=OK

## Using converted code from OLD conversion scripts

1. Converted code using 6.4.6.2 conversion scripts
2. Checked for normalized (0,0,0,1/256) and non-normalized (0,0,0256) for 416 cfg, it works
3. Checked with sample\_demo\_x11 for both normalized and non-normalized, it works
4. Checked with minimal nbg files, it works, only required to change the Makefile.linux by removing -lvsc from LIBS

#### checking for nbg\_unify\_yolov3\_sajjad\_416

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3$ cd bin\_r\_cv4/

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3/bin\_r\_cv4$ ./detect\_demo\_x11 -m 2 -p /media/khadas/SAJJAD/hussain/novelsense\_git/khadas/img/1920x1056/person\_1920x1056.jpg

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=3

result type is 2

i:3 left:1229.45 right:1790.18 top:346.862 bottom:860.901

i:3 left:201.707 right:618.665 top:649.367 bottom:883.02

i:3 left:565.385 right:837.692 top:265.694 bottom:919.725

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3/bin\_r\_cv4$

#### checking for nbg\_unify\_yolov3\_sajjad\_416normalized

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3/bin\_r\_cv4$ check 6.4.6.2 normalized, copy c,h and nb files^C

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3/bin\_r\_cv4$ cd ..

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3$ rm -rf bin\_r\_cv4/\*.o

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3$ ./build\_vx.sh

COMPILE /home/khadas/hussain/sample\_demo\_x11\_yolov3/detect\_log.c

COMPILE /home/khadas/hussain/sample\_demo\_x11\_yolov3/yolov3\_process.c

COMPILE /home/khadas/hussain/sample\_demo\_x11\_yolov3/vnn\_yolov3.c

vnn\_yolov3.c: In function ‘vnn\_CreateYolov3’:

vnn\_yolov3.c:146:29: warning: unused variable ‘data’ [-Wunused-variable]

146 | uint8\_t \* data;

| ^~~~

At top level:

vnn\_yolov3.c:94:17: warning: ‘load\_data’ defined but not used [-Wunused-function]

94 | static uint8\_t\* load\_data

| ^~~~~~~~~

COMPILE /home/khadas/hussain/sample\_demo\_x11\_yolov3/yolo\_v3.c

COMPILE /home/khadas/hussain/sample\_demo\_x11\_yolov3/main.cpp

main.cpp: In function ‘int run\_detect\_model(int, char\*\*)’:

main.cpp:334:10: warning: converting to non-pointer type ‘int’ from NULL [-Wconversion-null]

334 | return NULL;

| ^~~~

main.cpp:279:39: warning: unused variable ‘img\_width’ [-Wunused-variable]

279 | int nn\_height, nn\_width, nn\_channel, img\_width, img\_height;

| ^~~~~~~~~

main.cpp:279:50: warning: unused variable ‘img\_height’ [-Wunused-variable]

279 | int nn\_height, nn\_width, nn\_channel, img\_width, img\_height;

| ^~~~~~~~~~

main.cpp: At global scope:

main.cpp:251:13: warning: ‘void crop\_face(cv::Mat, cv::Mat&, DetectResult, int, int)’ defined but not used [-Wunused-function]

251 | static void crop\_face(cv::Mat sourceFrame, cv::Mat& imageROI, DetectResult resultData, int img\_height, int img\_width) {

| ^~~~~~~~~

main.cpp:98:17: warning: ‘screensize’ defined but not used [-Wunused-variable]

98 | static long int screensize = 0;

| ^~~~~~~~~~

main.cpp:97:33: warning: ‘finfo’ defined but not used [-Wunused-variable]

97 | static struct fb\_fix\_screeninfo finfo;

| ^~~~~

main.cpp:96:33: warning: ‘vinfo’ defined but not used [-Wunused-variable]

96 | static struct fb\_var\_screeninfo vinfo;

| ^~~~~

main.cpp:95:12: warning: ‘fbfd’ defined but not used [-Wunused-variable]

95 | static int fbfd = 0;

| ^~~~

make: Nothing to be done for 'all'.

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3$ cd bin\_r\_cv4/

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3/bin\_r\_cv4$ ./detect\_demo\_x11 -m 2 -p /media/khadas/SAJJAD/hussain/novelsense\_git/khadas/img/1920x1056/person\_1920x1056.jpg

det\_set\_log\_config Debug

det\_set\_model success!!

model.width:416

model.height:416

model.channel:3

Det\_set\_input START

Det\_set\_input END

Det\_get\_result START

Det\_get\_result END

resultData.detect\_num=3

result type is 2

i:3 left:1149.81 right:1869.81 top:346.862 bottom:860.901

i:3 left:201.707 right:618.665 top:649.367 bottom:883.02

i:3 left:565.385 right:837.692 top:267.849 bottom:921.88

khadas@Khadas:~/hussain/sample\_demo\_x11\_yolov3/bin\_r\_cv4$

## Profiling

With fresh OS and SDK (6.4.6.2) installation on old SD card:

1. Checked the yolov3 profiling, same mismatch timings
2. checked mobilenet minimal execution, works
3. Checked the profiling for mobilenet, same mismatch timings
4. changed makefile.linux by deleting the -lVSC from the LIBS
5. compared mobilenet profiling with earlier run in March, similar mismatching

### 20220724 executing the mobilenet minimal on old sd with new installations

Run the 1 time: 22.00ms or 22772.00us

vxProcessGraph execution time:

Total 23.00ms or 23281.00us

Average 23.28ms or 23281.00us

--- Top5 ---

813: 0.999023

405: 0.000266

868: 0.000135

896: 0.000108

0: 0.000000

khadas@Khadas:~/hussain/compilable/nbg\_unify\_mobilenet\_tf\_original/bin\_r$

### 20220724 profile\_mobilenet\_tf\_normal\_case\_demo\_original

Run the 1 time: 6569.00ms or 6569924.00us

vxProcessGraph execution time:

Total 6569.00ms or 6569945.00us

Average 6569.94ms or 6569945.00us

--- Top5 ---

813: 0.999023

405: 0.000266

868: 0.000135

896: 0.000108

0: 0.000000

Exit VX Thread: 0xb52cc1b0

### 20220315 board\_ performing eachtime calculations

Run the 1 time: 8584.00ms or 8584998.00us

vxProcessGraph execution time:

Total 8585.00ms or 8585021.00us

Average 8585.02ms or 8585021.00us

--- Top5 ---

813: 0.999023

405: 0.000266

868: 0.000135

896: 0.000108

0: 0.000000

Exit VX Thread: 0x9c4511b0

khadas@Khadas-teco:~/sajjad/eachoptime/op\_test/bin\_r\_cv4$