R-Car-V4x_HyCo_L_UserManual [한글 가이드]

2024.5.2

Index

설치파일 전체 공유 링크

https://nas.uniquest.kr:5001/sharing/Q2eAh2xlo

pass: hyco

Pre-build Docker Image

https://nas.uniquest.kr:5001/sharing/WoZf22RdA

pass: hyco

Step 1- Install the R-Car SDK on Linux PC

Version: sdk1_v3.24.0

참조문서: R-CarV4H_V4M_V3H_V3M_SDK_StartupGuide.pdf

환경: (Ubuntu20.04, 64bit)

필요 파일 (한 폴더에 복사할 것)

rcar-xos_platform-sdk1_v3.24.0_release.sh
rcarxos_tool_e2studio_ubuntu_v3.24.0 _release.tar.gz
rcarxos_tool_yocto_linux_v3.24.0_release.tar.gz
rcarxos_tool_poky_toolchain_ubuntu_v 3.24.0_release.tar.gz

```
root@ken-VirtualBox:~/Ken_Working_Folder# ls -al
total 5287332
drwxr-xr-x  2 root root       4096  5월  1 17:34 .
drwx------ 19 root root       4096  5월  1 17:32 ..
-rwxrwx---  1 root root 1476660410  4월 10 13:46 rcar-xos_platform-sdk1_v3.24.0_release.sh
-rwxrwx---  1 root root  620545439  4월 10 08:46 rcar-xos_tool_e2studio_ubuntu_v3.24.0_release.tar.gz
-rwxrwx---  1 root root  477294131  4월 10 08:46 rcar-xos_tool_poky_toolchain_ubuntu_v3.24.0_release.tar.gz
-rwxrwx---  1 root root 2839697573  4월 10 08:48 rcar-xos_tool_yocto_linux_v3.24.0_release.tar.gz
root@ken-VirtualBox:~/Ken_Working_Folder#
```

SDK 파일 공유링크

https://nas.uniquest.kr:5001/sharing/dOjEemhCd

pass: hyco

SDK 설치경로 : /opt/rcar-xos

additional tools 설치

sudo apt update && sudo apt install -y p7zip-full p7zip-rar

```
root@ken-VirtualBox:~/Ken_Working_Folder# sudo apt update && sudo apt install -y p7zip-full p7zip-rar
Get:1 https://download.docker.com/linux/ubuntu focal InRelease [57.7 kB]
Get:2 https://download.docker.com/linux/ubuntu focal/stable amd64 Packages [42.6 kB]
Hit:3 http://kr.archive.ubuntu.com/ubuntu focal InRelease
Get:4 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:5 http://kr.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Hit:6 http://kr.archive.ubuntu.com/ubuntu focal-backports InRelease
Get:7 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [2,892 kB]
Get:8 http://kr.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [3,269 kB]
Get:9 http://security.ubuntu.com/ubuntu focal-security/main i386 Packages [743 kB]
33% [8 Packages 442 kB/3,269 kB 14%] [9 Packages 2,711 B/743 kB 0%]
```

SDK 설치

./rcar-xos_platform-sdk1_v3.24.0_release.sh

```
root@ken-VirtualBox:~/Ken_Working_Folder# ./rcar-xos_platform-sdk1_v3.24.0_release.sh
Creating directory ./tmp
Verifying archive integrity...  100%   MD5 checksums are OK. All good.
Uncompressing 'rcar-xos'    37%
```

경로 /opt

```
root@ken-VirtualBox:~/Ken_Working_Folder# ./rcar-xos_platform-sdk1_v3.24.0_release.sh
Creating directory ./tmp
Verifying archive integrity...  100%   MD5 checksums are OK. All good.
Uncompressing 'rcar-xos'  100%
==========================================================
========== Welcome to R-Car SDK Linux Setup ==========
==========================================================

============================================================
Step 1: Enter Installation location
Press ENTER key to use the default path (~/Renesas)
To use custom path, type the path and press ENTER key
============================================================
: /opt
----- Checking if the path (/opt) already exists -----
The path exists already.
The destination directory is: /opt/rcar-xos

----- Preparing the R-Car SDK package -----
```

Poky install

```
Choose poky_toolchain installation file location            (default: /root/Ken_Working_Folder/rcar-xos_tool_poky_toolchain_ubuntu_v3.24.0_release.tar.gz):
>
Checking MD5sum of poky_toolchain: OK
Extracting installation file of poky_toolchain: ..........................................................................................OK
Poky (Yocto Project Reference Distro) SDK installer version 3.1.11
==========================================================================
You are about to install the SDK to "/opt/rcar-xos/v3.24.0/tools/toolchains/poky". Proceed [Y/n]? Y
Extracting SDK.....................................................................
```

E2studio install

```
Do you want to install e2studio? [Y/n]Y
----- Start to install e2studio -----
Choose e2studio installation file location            (default: /root/Ken_Working_Folder/rcar-xos_tool_e2studio_ubuntu_v3.24.0_release.tar.gz):
>
Checking MD5sum of e2studio: OK
Extracting installation file of e2studio: ..................................................................................................................OK
.....................................................................................................................
e2studio is installed successfully.
```

Yocto Linux RootFS, Image, DTB install

```
Do you want to install Yocto Linux RootFS, Image, DTB? [Y/n]Y
----- Start to install Yocto Linux RootFS, Image, DTB -----
Choose yocto_linux installation file location            (default: /root/Ken_Working_Folder/rcar-xos_tool_yocto_linux_v3.24.0_release.tar.gz):
>
Checking MD5sum of yocto_linux:
```

CVe Toolchain install

```
Do you want to install CVe toolchain? [Y/n]Y
----- Start to install CVe toolchain -----
You are using Ubuntu version 20.
This PC does not have libc6:i386/libncurses5:i386/libstdc++6:i386.
Hit:1 https://download.docker.com/linux/ubuntu focal InRelease
Hit:2 http://kr.archive.ubuntu.com/ubuntu focal InRelease
Hit:3 http://kr.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:4 http://kr.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:5 http://security.ubuntu.com/ubuntu focal-security InRelease
Reading package lists... 5%
```

Cmake install

```
==================================================================
Step 3: Choose the external software
==================================================================
Do you want to install CMake 3.21.0? [Y/n] Y
----- Start to check your PC already had CMake or not -----
This PC does not have CMake.

License agreements for the external tools
https://cmake.org/licensing
Type [yes/y] if you accept the term of License Agreement yes
----- Start to install CMake 3.21.0 -----
.........................
CMake 3.21.0 is installed successfully.
```

Build-essential install

```
Do you want to install build-essential? [Y/n] Y
----- Start to check your PC already had build-essential or not -----
This PC does not have build-essential.
License agreements for the external tools
https://www.gnu.org/licenses/licenses.html
Type yes/y if you accept the term of License Agreement yes
----- Start to install build-essential. -----
Hit:1 https://download.docker.com/linux/ubuntu focal InRelease
Hit:2 http://security.ubuntu.com/ubuntu focal-security InRelease
Hit:3 http://kr.archive.ubuntu.com/ubuntu focal InRelease
Hit:4 http://kr.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:5 http://kr.archive.ubuntu.com/ubuntu focal-backports InRelease
Reading package lists... Done
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

Finished

환경변수 설정 (Set PATH environment)

export SDKROOT=<installation_root>/rcar-xos/v3.24.0/tools/toolchains/poky

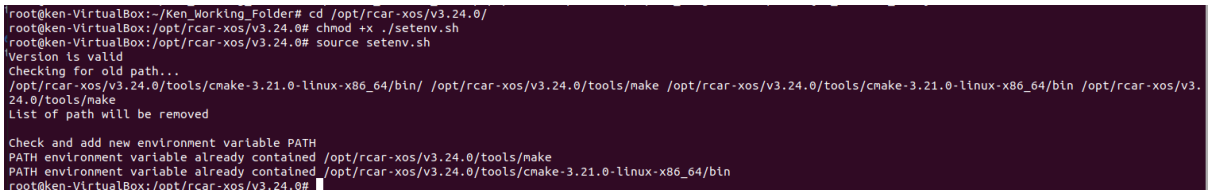
export PATH=$PATH:<installation_root>/rcar-xos/v3.24.0/tools/ cmake-3.21.0-linux-x86_64/bin:<installation_root>/rcar-xos/v3.24.0/tools/make

export LD_LIBRARY_PATH=<installation_root>/rcar-xos/v3.24.0/sw/x86_64-gnulinux/lib:${LD_LIBRARY_PATH}

또는

> cd <installation_root>/rcar-xos/v3.24.0/ > chmod +x ./setenv.sh

> source setenv.sh



Step 2- Install Ceva-DSP Package on Linux PC

Version: CEVA-SensPro_V22.0.2.GA

참조문서: R-Car-V4x_HyCo_L_UserManual.pdf

환경: (Ubuntu20.04, 64bit)

필요 파일

CEVA-SensPro_V22.0.2.GA.jar

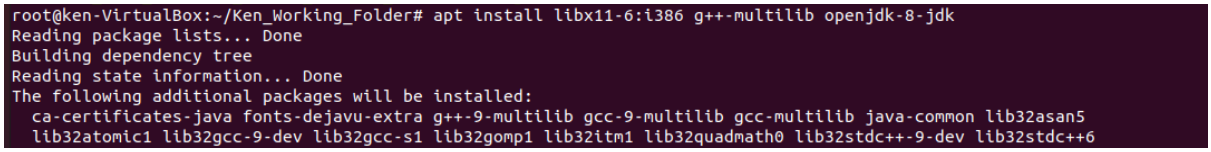
SDK 파일 공유링크

https://nas.uniquest.kr:5001/sharing/ia6IX503S

pass: hyco

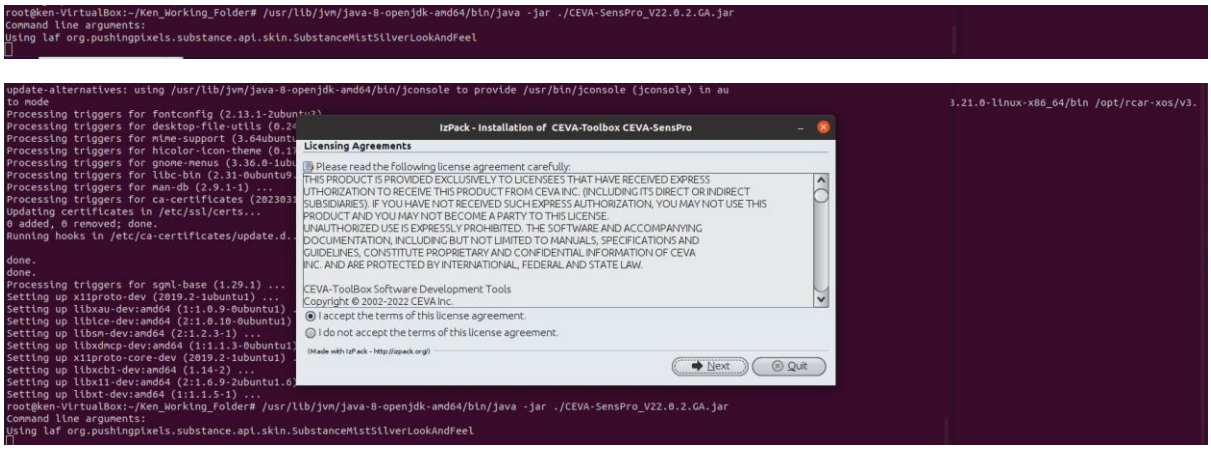
install dependent packages

apt install libx11-6:i386 g++-multilib openjdk-8-jdk

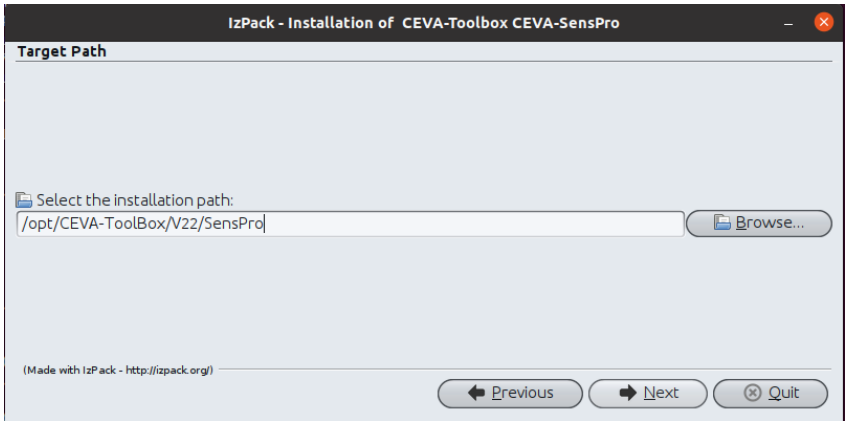


run the installer (CEVA SDT license is needed)

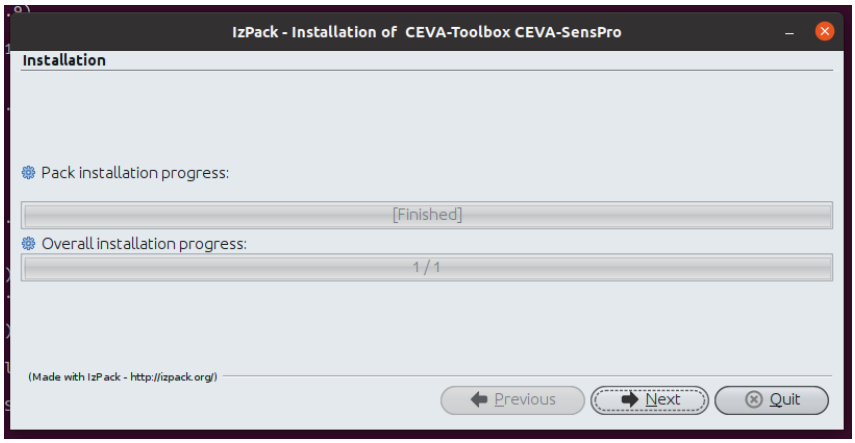
/usr/lib/jvm/java-8-openjdk-amd64/bin/java -jar </path/to/CEVA-SensPro_V22.X.X.RC.jar>

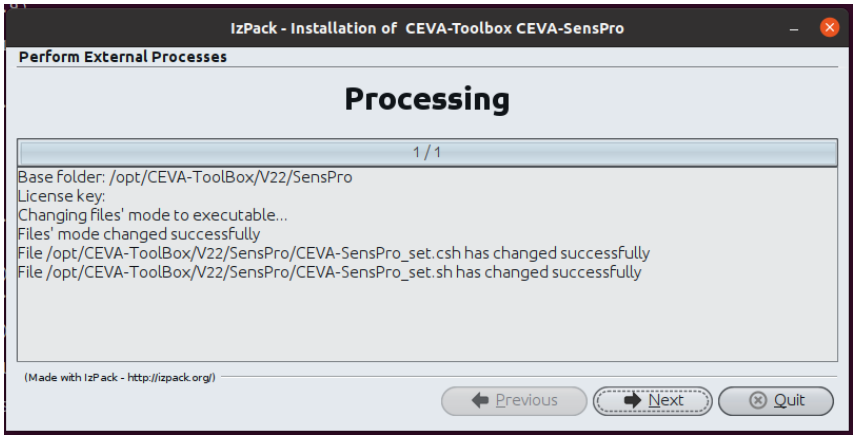


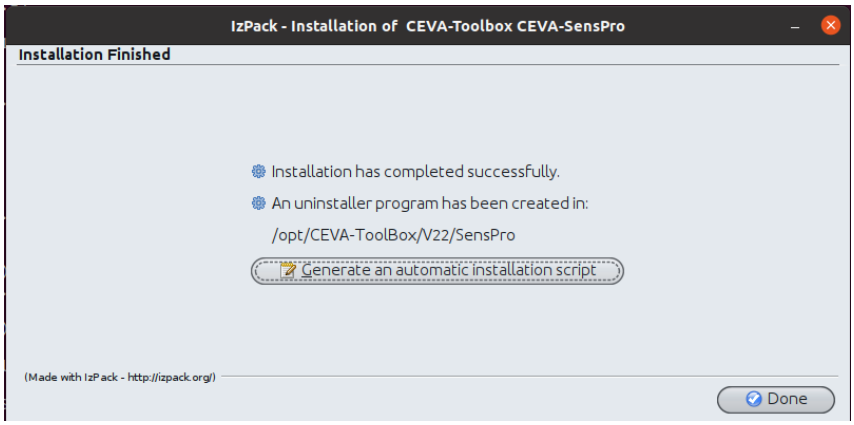
경로: /opt/CEVA-ToolBox/V22/SensPro



설치완료







Step 3- Install TVM Package on Linux PC

Version: CEVA-SensPro_V22.0.2.GA

참조문서: R-Car-V4x_HyCo_L_UserManual.pdf/20240411_HybridCompiler_workshop_Mobis.pdf

환경: (Ubuntu20.04, 64bit)

Install RDL

필요 파일

rdl.tar.gz

https://nas.uniquest.kr:5001/sharing/weTmyvzUI

pass: hyco

mkdir -p /opt/ceva-cdnn : 확인이 필요함. 해당 폴더가 현재 없어서 강제로 만듦

sudo tar xvf rdl.tar.gz -C /opt/ceva-cdnn/ --strip-components=1

```
root@ken-VirtualBox:~/Ken_Working_Folder# sudo tar xvf rdl.tar.gz -C /opt/ceva-cdnn/ --strip-components=1
cdnn/Binary/
cdnn/Binary/CDNN/
cdnn/Binary/CDNN/gen/
cdnn/Binary/CDNN/gen/CDNNBin/
cdnn/Binary/CDNN/gen/CDNNBin/Dll/
cdnn/Binary/CDNN/gen/CDNNBin/Dll/LINUX/
cdnn/Binary/CDNN/gen/CDNNBin/Dll/LINUX/RenesasDeviceLibrary.so
cdnn/Binary/CDNN/main/
cdnn/Binary/CDNN/main/CDNNDevices/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Interface/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Interface/Include/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Interface/Include/common_defines.h
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/rdb_cg/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/rdb_cg/CommandGenerator/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/rdb_cg/CommandGenerator/include/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/rdb_cg/CommandGenerator/include/r_cg.h
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/rdb_cg/CLPiece/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/rdb_cg/CLPiece/include/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/rdb_cg/CLPiece/include/r_clp_types.h
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/rdb_cg/CLPiece/include/r_clp_prot.h
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Infrastructure/Scheduling/rdb_cg/CLPiece/include/r_clp_def.h
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Application/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Application/Include/
cdnn/Binary/CDNN/main/CDNNDevices/RenesasDeviceLibrary/Application/Include/SimpleApplicationInterface.h
root@ken-VirtualBox:~/Ken_Working_Folder#
```

INSTALL R-CAR DKL

필요 파일

rcardkl-0.1.0.dev37878a84e0991-senspro.tar.gz

rcardkl-0.1.0.dev37878a84e0991-senspro_profile.tar.gz

rcardkl-0.1.0.dev37878a84e0991-x86_64.tar.gz

공유링크

https://nas.uniquest.kr:5001/sharing/PGrmdnBvU

pass: hyco

mkdir -p /opt/rcardkl/senspro_profile (확인이 필요함. 해당 폴더가 현재 없어서 강제로 만듦)

tar xvf rcardkl-0.1.0.dev37878a84e0991-senspro_profile.tar.gz -C /opt/rcardkl/senspro_profile --strip-components=1

```
root@ken-VirtualBox:~/Ken_Working_Folder/DKL# tar xvf rcardkl-0.1.0.dev37878a84e0991-senspro_profile.tar.gz -C /opt/rcardkl/senspro_profile --strip-components=1
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/lib/
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/lib/librcardkl.a
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/lib/cmake/
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/lib/cmake/rcardkl/
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/lib/cmake/rcardkl/rcardklConfigVersion.cmake
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/lib/cmake/rcardkl/rcardklConfig.cmake
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/lib/cmake/rcardkl/rcardklTargets-release.cmake
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/lib/cmake/rcardkl/rcardklTargets.cmake
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/r_rcardkl_operator_id.h
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/r_rcardkl_graph_api.h
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/r_rcardkl_api.h
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/r_rcardkl_log_api.h
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/r_rcardkl_multicore.h
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/r_rcardkl_dma_api.h
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/kernel/
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/kernel/r_rcardkl_dequantize_linear.h
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/kernel/r_rcardkl_less.h
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/kernel/r_rcardkl_shape.h
rcardkl-0.1.0.dev37878a84e0991-senspro_profile/include/rcar-xos/rcardkl/kernel/r_rcardkl_sqrt.h
```

Install Hybrid Compiler (HyCo) add-on package for R-Car SDK

필요 파일

rcar-xos_hyco_v3.24.0_addon_20240401.zip

공유링크

https://nas.uniquest.kr:5001/sharing/M35QFJ8t5

pass: hyco

압축을 풀고 기존 R-Car SDK에 복사(overwrite)한다

폴더 구조

```
rcar-xos/
    <sdk ver>/
        docs/
            sw/
                hyco/
                    release_note/
                        R-Car-V4x_HyCo_L_ReleaseNote.docx
                    user_manual/
                        R-Car-V4x_HyCo_L_UserManual.pdf
        tools/
            hyco/
                model.tar.bz2
                sw.tar.bz2
```

```
root@ken-VirtualBox:~/Ken_Working_Folder/rcar-xos_hyco_v3.24.0_addon_20240401# ls
rcar-xos  README.md
root@ken-VirtualBox:~/Ken_Working_Folder/rcar-xos_hyco_v3.24.0_addon_20240401# cp -r rcar-xos /opt
root@ken-VirtualBox:~/Ken_Working_Folder/rcar-xos_hyco_v3.24.0_addon_20240401#
```

#해당 경로에 압축파일을 풀어준다

/opt/rcar-xos/v3.24.0/tools/hyco

tar xvf sw.tar.bz2

```
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco# ls -al
total 129476
drwx------  2 root root      4096  5월  1 20:15 .
drwxr-xr-x 10 1001 1001      4096  5월  1 20:15 ..
-rw-r--r--  1 root root  19036160  5월  1 20:15 models.tar.bz2
-rw-r--r--  1 root root 113534216  5월  1 20:15 sw.tar.bz2
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco# chmod 777 models.tar.bz2
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco# chmod 777 sw.tar.bz2
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco# tar xvf sw.tar.bz2
sw/
sw/tool_package/
sw/tool_package/DKL/
sw/tool_package/DKL/rcardkl-0.1.0.dev37878a84e0991-senspro.tar.gz
sw/tool_package/DKL/rcardkl-0.1.0.dev37878a84e0991-senspro_profile.tar.gz
sw/tool_package/DKL/rcardkl-0.1.0.dev37878a84e0991-x86_64.tar.gz
sw/tool_package/R-Car-ort-Quantizer/
sw/tool_package/R-Car-ort-Quantizer/docker/
sw/tool_package/R-Car-ort-Quantizer/docker/build.sh
sw/tool_package/R-Car-ort-Quantizer/docker/Dockerfile
sw/tool_package/R-Car-ort-Quantizer/docs/
sw/tool_package/R-Car-ort-Quantizer/docs/main/
sw/tool_package/R-Car-ort-Quantizer/docs/main/index.adoc
```

tar xvf models.tar.bz2

```
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco# tar xvf models.tar.bz2
./models/
./models/rcar_hf/
./models/rcar_hf/docker/
./models/rcar_hf/docker/install/
./models/rcar_hf/docker/install/install_rcardkl.sh
./models/rcar_hf/docker/install/onnx_auto_partition-0.3.1.tar.gz
./models/rcar_hf/docker/install/install_rcar_xos.sh
./models/rcar_hf/docker/v4h_org.Dockerfile
./models/rcar_hf/docker/run.sh
./models/rcar_hf/docker/build.sh
./models/rcar_hf/docker/adduser.Dockerfile
./models/rcar_hf/docker/requirements.txt
./models/rcar_hf/docker/Dockerfile
./models/rcar_hf/rcar_hf/
./models/rcar_hf/rcar_hf/backend.py
./models/rcar_hf/rcar_hf/pytorch.py
./models/rcar_hf/rcar_hf/onnxation.py
./models/rcar_hf/rcar_hf/__init__.py
./models/rcar_hf/rcar_hf/utility/
```

v4h.Dockerfile 파일수정 -1

root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# vim v4h.Dockerfile

72 ~ 74 Line 주석처리

```
root@ken-VirtualBox: /opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker
RUN cd /mmdeploy && patch -p1 < mmdeploy_tvm_backend.patch
COPY docker/mmdeploy_onnx_export.patch /mmdeploy/mmdeploy_onnx_export.patch
RUN cd /mmdeploy && patch -p1 < mmdeploy_onnx_export.patch
COPY docker/mmdeploy_ort_deterministic.patch /mmdeploy/mmdeploy_ort_deterministic.patch
RUN cd /mmdeploy && patch -p1 < mmdeploy_ort_deterministic.patch
ENV PYTHONPATH=$PYTHONPATH:/mmdeploy:/workspace
ENV LD_LIBRARY_PATH=/onnxruntime-linux-x64-gpu-1.14.1/lib${LD_LIBRARY_PATH:+:$LD_LIBRARY_PATH}

# Install rcar-xos
ARG RCAR_XOS_VERSION=3.24.0
#COPY docker/install/install_rcar_xos.sh /install/install_rcar_xos.sh
#COPY docker/install/rcar-xos-v3.24.0-x86_64-gnu-linux.tar.gz  /
#RUN /install/install_rcar_xos.sh ${RCAR_XOS_VERSION} "x86_64-gnu-linux" /opt/rcar-xos
ENV LD_LIBRARY_PATH=/opt/rcar-xos/v${RCAR_XOS_VERSION}/sw/x86_64-gnu-linux/lib${LD_LIBRARY_PATH:+:$LD_LIBRARY_PATH}

# Install rcardkl 0.1.0.dev37878a84e0991
ARG DKL_VERSION=0.1.0.dev37878a84e0991
ENV DKL_VERSION=$DKL_VERSION
COPY docker/install/install_rcardkl.sh /install/install_rcardkl.sh
COPY docker/install/rcardkl-0.1.0.dev37878a84e0991-senspro.tar.gz /
COPY docker/install/rcardkl-0.1.0.dev37878a84e0991-x86_64.tar.gz /
RUN /install/install_rcardkl.sh ${DKL_VERSION}

# NOTE: tvm and rcardkl requires cmake==3.18.4
RUN python3 -m pip install --no-cache-dir cmake=="3.18.4"

-- INSERT --                                                    74,2          77%
```

v4h.Dockerfile 파일수정 -2

해당 폴더에 있는 패키지 파일명으로 도커파일 수정

/opt/rcar-xos/v3.24.0/tools/hyco/sw/tvm_package/build

tvm_rcar_v4h2-0.14.0.dev2+g31d025bdb-cp38-cp38-linux_x86_64.whl

```
root@ken-VirtualBox:~# cd /opt/rcar-xos/v3.24.0/tools/hyco/sw/tvm_package/build
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/sw/tvm_package/build# ls
tvm_rcar_v4h2-0.14.0.dev2+g31d025bdb-cp38-cp38-linux_x86_64.whl
tvm_rcar_v4h2_on_board-0.14.0.dev2+ga39635c7a-cp38-cp38-linux_aarch64.whl
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/sw/tvm_package/build#
```

v4h.Dockerfile 에서 아래처럼 수정

ARG TVM_PACKAGE_VERSION=0.14.0.dev2+ga39635c7a

COPY docker/install/tvm_rcar_v4h2-0.14.0.dev2+g31d025bdb-cp38-cp38-linux_x86_64.whl /tvm_rcar_v4h2-0.14.0.dev2+g31d025bdb-cp38-cp38-linux_x86_64.whl

RUN python3 -m pip install --no-cache-dir /tvm_rcar_v4h2-0.14.0.dev2+g31d025bdb-cp38-cp38-linux_x86_64.whl

```
# Install rcardkl 0.1.0.dev37878a84e0991
ARG DKL_VERSION=0.1.0.dev37878a84e0991
ENV DKL_VERSION=$DKL_VERSION
COPY docker/install/install_rcardkl.sh /install/install_rcardkl.sh
COPY docker/install/rcardkl-0.1.0.dev37878a84e0991-senspro.tar.gz /
COPY docker/install/rcardkl-0.1.0.dev37878a84e0991-x86_64.tar.gz /
RUN /install/install_rcardkl.sh ${DKL_VERSION}

# NOTE: tvm and rcardkl requires cmake==3.18.4
RUN python3 -m pip install --no-cache-dir cmake=="3.18.4"

# Install tvm for rcar
ARG TVM_PACKAGE_NAME=tvm-rcar-v4h2-manual
#ARG TVM_PACKAGE_VERSION=0.14.dev202403270513+rcar3240
#COPY docker/install/tvm_rcar_v4h2_manual-0.14.dev202403270513+rcar3240-cp38-cp38-linux_x86_64.whl /tvm_rcar_v4h2_manual-0.14.dev202403270513+rcar3240-cp38-c
p38-linux_x86_64.whl
#RUN python3 -m pip install  --no-cache-dir  /tvm_rcar_v4h2_manual-0.14.dev202403270513+rcar3240-cp38-cp38-linux_x86_64.whl
ARG TVM_PACKAGE_VERSION=0.14.0.dev2+ga39635c7a
COPY docker/install/tvm_rcar_v4h2-0.14.0.dev2+g31d025bdb-cp38-cp38-linux_x86_64.whl /tvm_rcar_v4h2-0.14.0.dev2+g31d025bdb-cp38-cp38-linux_x86_64.whl
RUN python3 -m pip install  --no-cache-dir  /tvm_rcar_v4h2-0.14.0.dev2+g31d025bdb-cp38-cp38-linux_x86_64.whl


# Install rcar-ort-quantizer
COPY docker/install/rcar_ort_quantizer-0.6.0.tar.gz /rcar_ort_quantizer-0.6.0.tar.gz
RUN mkdir -p rcar-ort-quantizer && tar xzf rcar_ort_quantizer-0.6.0.tar.gz --strip-components 1 -C rcar-ort-quantizer
RUN cd rcar-ort-quantizer &&  python3 -m pip install --no-cache-dir  .
```

adduser.Dockerfile 파일수정 -3

vim adduser.Dockerfile

9~12 라인 주석처리

```
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab# cd docker/
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# ls
adduser.Dockerfile  download_pkg.sh  mmdeploy_onnx_export.patch       mmdeploy_tvm_backend.patch  v4h.Dockerfile      v4h_requirements.txt
build.sh            install          mmdeploy_ort_deterministic.patch  run.sh                      v4h_org.Dockerfile
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# vim adduser.Dockerfile
```

root@ken-VirtualBox: /opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker

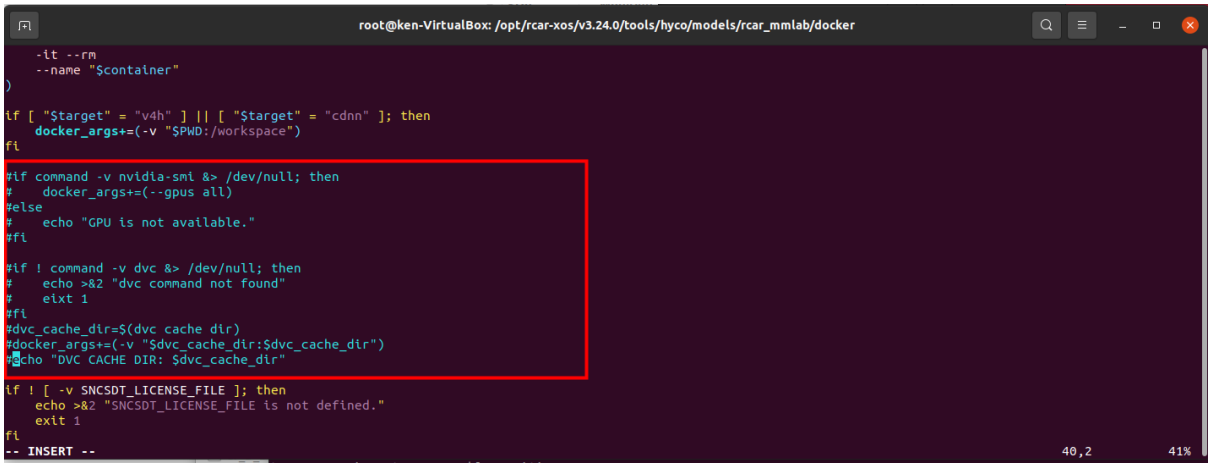
```
# Dockerfile for creating a user

ARG BASE
FROM ${BASE}

ARG USER
ARG UID
ARG GID
#RUN groupadd -g "${GID}" "${USER}" \
#    && useradd -lms /bin/bash -u "${UID}" -g "${GID}" "${USER}" \
#    && echo "${USER} ALL=(ALL) NOPASSWD: ALL" > /etc/sudoers.d/userconf \
#    && chmod 0440 /etc/sudoers.d/userconf

WORKDIR /workspace
RUN chown -R "${UID}" /workspace
USER "${USER}"
~
~
~
~
~
~
~
~
~
~
-- INSERT --                                                                    12,2          All
```

run.sh 파일수정 -1

28-40 라인 GPU 관련 주석처리

root@ken-VirtualBox: /opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker

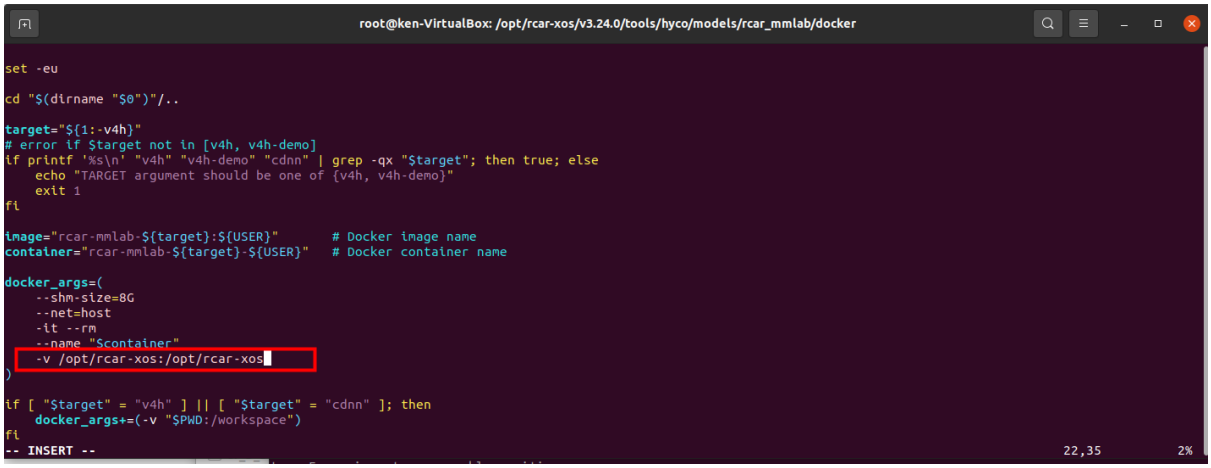
```
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# pwd
/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# vim run.sh
```



run.sh 파일수정 -2

R-Car SDK 폴더 도커 실행 시 SDK 설치 폴더 볼륨 마운트 추가

```
docker_args=(
    --shm-size=8G
    --net=host
    -it --rm
    --name "$container"
    -v /opt/rcar-xos:/opt/rcar-xos
)
```



Step 4- Build and run a Docker image for R-Car MMLab

경로이동

cd /opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker

DATA 파일 오버라이트

필요파일 : DATA.ZIP

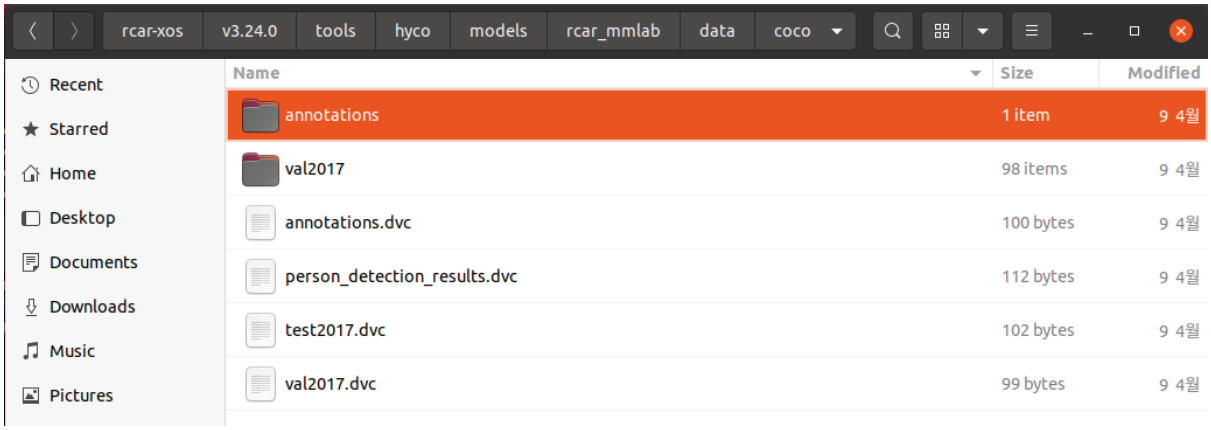
공유링크

https://nas.uniquest.kr:5001/sharing/i4WJinkmM

pass: hyco

data.zip 파일을 /opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/data 에 overwrite 해준다

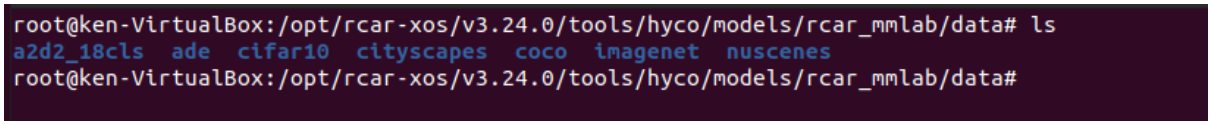
예) coco의 경우 아래와 같은 파일 구조로 복사되면 됨



아래의 인자를 추가해준다

export CEVA_TOOLBOX_ROOT="/opt/CEVA-ToolBox/V22"

Note: CEVA-ToolBox, DATA 의 경로를 확인할 것



필요파일 복사

opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker/install

폴더에

rcardkl-0.1.0.dev37878a84e0991-senspro.tar.gz

rcardkl-0.1.0.dev37878a84e0991-x86_64.tar.gz

rcar_ort_quantizer-0.6.0.tar.gz

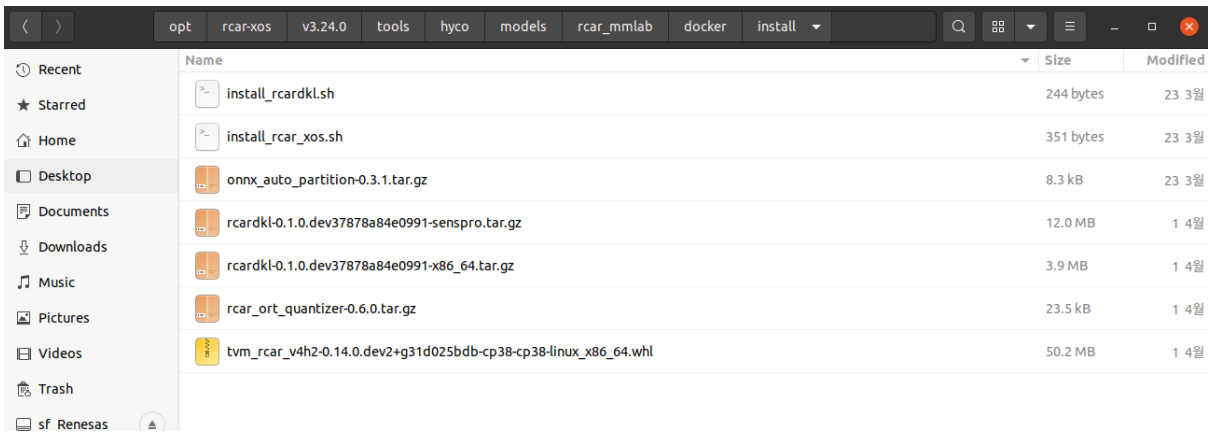
tvm_rcar_v4h2-0.14.0.dev2+g31d025bdb-cp38-cp38-linux_x86_64.whl

를 복사한다

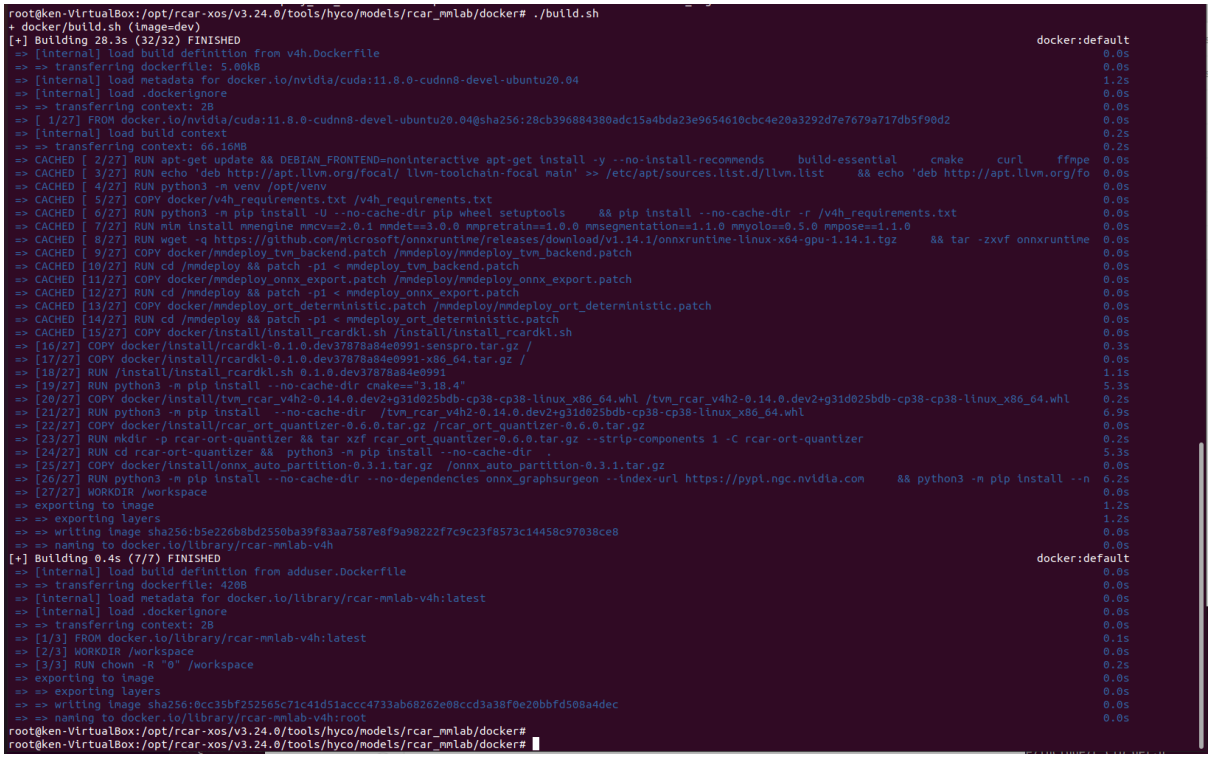
공유링크

https://nas.uniquest.kr:5001/sharing/5yHAzIQfg

pass: hyco



Docker Build



Note: build 에러 발생시 Pre-build 된 도커 파일을 사용 -> 이 문서 Index의 Pre-build Docker Image를 사용하여 도커를 Load 함

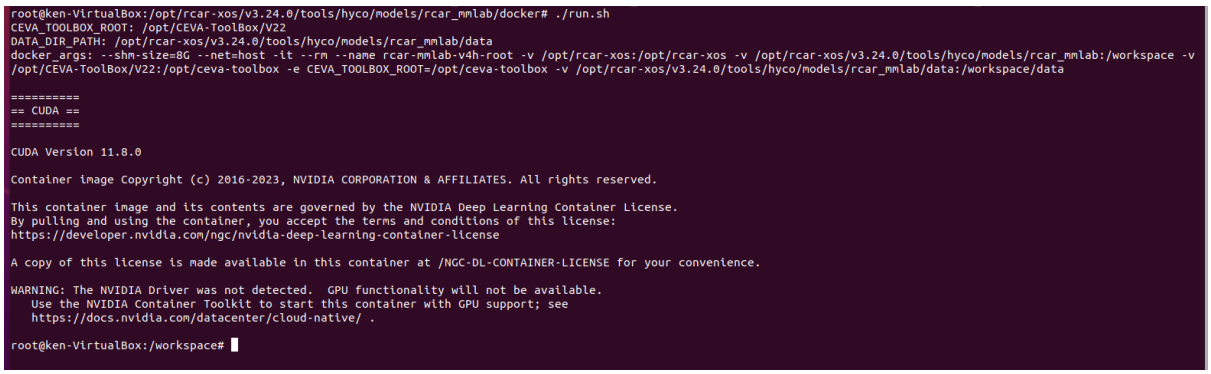
Docker Run

도커를 실행합니다.

root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# ./run.sh

Note: 실행이 되면 아래와 같은 초기화면이 나옵니다. 도커실행후 디렉토리는 default 로 workspace 로 이동된다.

root@ken-VirtualBox:/workspace#



EVALUATE PRE-TRAINED PYTORCH MODEL

아래의 인자를 export

export MODEL_CFG='https://github.com/open-mmlab/mmpretrain/blob/1.0.0/configs/resnet/resnet101_8xb32_in1k.py'

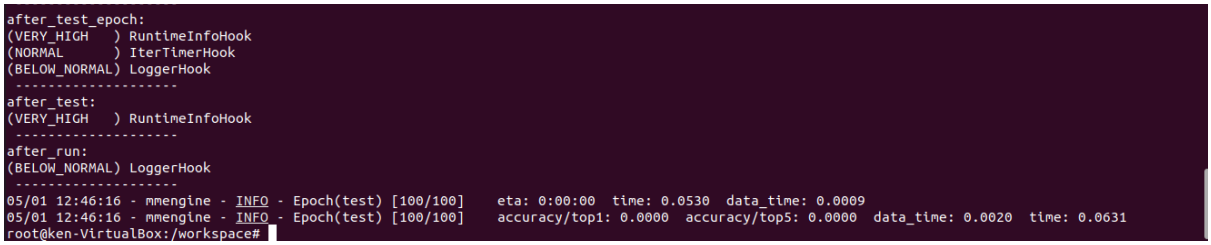
export MODEL_URL='https://download.openmmlab.com/mmclassification/v0/resnet/resnet18_8xb32_in1k_20210831-fbbb1da6.pth'

그리고 PRE-TRAINED PYTORCH MODEL 를 실행.

Note: 외부 Internet 접속 제한으로 문제 발생시 -> 이 문서 첫장 Index Workaround 항목 참고

python3 rcar_mmlab/run.py configs/pytorch.py ₩
${MODEL_CFG} ₩ ${MODEL_URL} ₩
--deploy-cfg-options 'subset=100'

실행&실행결과



Pytorch2onnx

python3 rcar_mmlab/run.py configs/onnx.py ₩

${MODEL_CFG} ₩ ${MODEL_URL} ₩

--deploy-cfg-options 'subset=100'

```
root@ken-VirtualBox:/workspace# python3 rcar_mmlab/run.py configs/onnx.py \
> ${MODEL_CFG} \
> ${MODEL_URL} \
> --deploy-cfg-options 'subset=100'
/workspace/rcar_mmlab/config/mlflow_integration.py:49: UserWarning: downloaded file resnet18_8xb32_in1k_20210831-fbbb1da6.pth is already exist. sk
ip downloading.
  warnings.warn(f"downloaded file {dst_filename} is already exist. skip downloading.")
INFO:rcar_mmlab.model_convert.auto:convert: ['torch2onnx']
INFO:rcar_mmlab.model_convert.torch2onnx:Start torch2onnx
05/01 13:02:39 - mmengine - WARNING - Failed to search registry with scope "mmpretrain" in the "Codebases" registry tree. As a workaround, the cur
rent "Codebases" registry in "mmdeploy" is used to build instance. This may cause unexpected failure when running the built modules. Please check
whether "mmpretrain" is a correct scope, or whether the registry is initialized.
05/01 13:02:39 - mmengine - WARNING - Failed to search registry with scope "mmpretrain" in the "mmpretrain_tasks" registry tree. As a workaround,
the current "mmpretrain_tasks" registry in "mmdeploy" is used to build instance. This may cause unexpected failure when running the built modules.
```

```
 --------------------
after_run:
(BELOW_NORMAL) LoggerHook
 --------------------
05/01 13:02:56 - mmengine - INFO - Epoch(test) [100/100]    eta: 0:00:00  time: 0.0569  data_time: 0.0010
05/01 13:02:56 - mmengine - INFO - Epoch(test) [100/100]    accuracy/top1: 0.0000  accuracy/top5: 0.0000  data_time: 0.0046  time: 0.0712
root@ken-VirtualBox:/workspace#
```

R-Car ORT Quantizer

python3 rcar_mmlab/run.py configs/v4h/quant_onnx.py ₩

${MODEL_CFG} ₩

./work_dir/end2end_sim.onnx ₩

--deploy-cfg-options 'subset=100'

```
root@ken-VirtualBox:/workspace# python3 rcar_mmlab/run.py configs/v4h/quant_onnx.py \
> ${MODEL_CFG} \
> ./work_dir/end2end_sim.onnx \
> --deploy-cfg-options 'subset=100'
INFO:rcar_mmlab.model_convert.auto:convert: ['quantize_onnx']
INFO:rcar_mmlab.model_convert.quantize_onnx:Start quantize_onnx
INFO:rcar_mmlab.model_convert.quantize_onnx:quantization config: {'backend': 'rcar_ort_quantizer', 'dataset_samples': 100, 'calib_data_root': None
, 'save_calib_data': False}
05/01 13:11:22 - mmengine - WARNING - Failed to search registry with scope "mmpretrain" in the "Codebases" registry tree. As a workaround, the cur
rent "Codebases" registry in "mmdeploy" is used to build instance. This may cause unexpected failure when running the built modules. Please check
whether "mmpretrain" is a correct scope, or whether the registry is initialized.
05/01 13:11:22 - mmengine - WARNING - Failed to search registry with scope "mmpretrain" in the "mmpretrain_tasks" registry tree. As a workaround,
the current "mmpretrain_tasks" registry in "mmdeploy" is used to build instance. This may cause unexpected failure when running the built modules.
 Please check whether "mmpretrain" is a correct scope, or whether the registry is initialized.
INFO:rcar_mmlab.model_convert.quantize_onnx:Args for quantize_static: {}
[info] /backbone/relu/Relu may be fused into /backbone/conv1/Conv
[info] /backbone/maxpool/MaxPool may be fused into /backbone/relu/Relu
[info] /backbone/layer1/layer1.0/relu/Relu may be fused into /backbone/layer1/layer1.0/conv1/Conv
[info] /backbone/layer1/layer1.0/relu_1/Relu may be fused into /backbone/layer1/layer1.0/conv2/Conv
[info] /backbone/layer1/layer1.0/relu_2/Relu may be fused into /backbone/layer1/layer1.0/Add
```

```
after_run:
(BELOW_NORMAL) LoggerHook
 --------------------
05/01 13:11:52 - mmengine - INFO - Epoch(test) [100/100]    eta: 0:00:00  time: 0.0631  data_time: 0.0009
05/01 13:11:52 - mmengine - INFO - Epoch(test) [100/100]    accuracy/top1: 0.0000  accuracy/top5: 0.0000  data_time: 0.0034  time: 0.0762
root@ken-VirtualBox:/workspace#
```

TVM (CPU) on x86_64

python3 rcar_mmlab/run.py configs/tvm.py ₩

${MODEL_CFG} ₩

$PWD/work_dir/quantized_onnx/end2end_sim_quant.onnx ₩

--deploy-cfg-options 'subset=100'

```
root@ken-VirtualBox:/workspace# python3 rcar_mmlab/run.py configs/tvm.py \
> ${MODEL_CFG} \
> $PWD/work_dir/quantized_onnx/end2end_sim_quant.onnx \
> --deploy-cfg-options 'subset=100'
/workspace/rcar_mmlab/model_convert/auto.py:54: UserWarning: input model is already quantized. skip quantization...
  warnings.warn("input model is already quantized. skip quantization...")
INFO:rcar_mmlab.model_convert.auto:convert: ['onnx2tvm']
INFO:rcar_mmlab.model_convert.onnx2tvm:Start onnx2tvm
INFO:autotvm:Download pre-tuned parameters package from https://raw.githubusercontent.com/tlc-pack/tophub/main/tophub/llvm_v0.04.log
INFO:download:Downloading from url https://raw.githubusercontent.com/tlc-pack/tophub/main/tophub/llvm_v0.04.log to /root/.tvm/tophub/llvm_v0.04.lo
g
WARNING:autotvm:One or more operators have not been tuned. Please tune your model for better performance. Use DEBUG logging level to see more deta
ils.

INFO:rcar_mmlab.model_convert.onnx2tvm:Successfully exported TVM model for ['llvm']: ['/workspace/work_dir/tvm/end2end_sim_quant.tar']
INFO:rcar_mmlab.evaluate.tvm_benchmark:Start latency evaluation
total: n = 1, min = 529.510514 ms, max = 529.510514 ms, avg = 529.510514 ms, std = 0.0
cnnip: n = 1, min = 0.0 ms, max = 0.0 ms, avg = 0.0 ms, std = 0.0
```

```
after_run:
(BELOW_NORMAL) LoggerHook
 --------------------
/opt/venv/lib/python3.8/site-packages/torch/utils/data/dataloader.py:554: UserWarning: This DataLoader will create 5 worker processes in total. Ou
r suggested max number of worker in current system is 2, which is smaller than what this DataLoader is going to create. Please be aware that exces
sive worker creation might get DataLoader running slow or even freeze, lower the worker number to avoid potential slowness/freeze if necessary.
  warnings.warn(_create_warning_msg(
05/01 13:21:17 - mmengine - INFO - Epoch(test) [100/100]    eta: 0:00:00  time: 0.6392  data_time: 0.0009
05/01 13:21:17 - mmengine - INFO - Epoch(test) [100/100]    accuracy/top1: 0.0000  accuracy/top5: 0.0000  data_time: 0.0039  time: 0.6488
root@ken-VirtualBox:/workspace#
```

Workaround

export MODEL_CFG, MODEL_URL 를 수동으로 로컬에 다운로드

기존 경로

export MODEL_CFG='https://github.com/open-mmlab/mmpretrain/blob/1.0.0/configs/resnet/resnet101_8xb32_in1k.py'

export MODEL_URL='https://download.openmmlab.com/mmclassification/v0/resnet/resnet18_8xb32_in1k_20210831-fbbb1da6.pth'

매뉴얼로 다운받은 뒤 export

export MODEL_CFG='/workspace/mmpretrain/configs/resnet/resnet101_8xb32_in1k.py'

export MODEL_URL='/workspace/resnet18_8xb32_in1k_20210831-fbbb1da6.pth'

#MODEL_CFG

git 으로 로컬 다운로드

도커실행후 /workspace 폴더에 git clone

git clone https://github.com/open-mmlab/mmpretrain.git

```
root@ken-VirtualBox:/workspace# git clone https://github.com/open-mmlab/mmpretrain.git
Cloning into 'mmpretrain'...
remote: Enumerating objects: 17495, done.
remote: Counting objects: 100% (153/153), done.
remote: Compressing objects: 100% (98/98), done.
remote: Total 17495 (delta 62), reused 118 (delta 53), pack-reused 17342
Receiving objects: 100% (17495/17495), 13.82 MiB | 9.81 MiB/s, done.
Resolving deltas: 100% (12149/12149), done.
root@ken-VirtualBox:/workspace# ls
HyCo_Model_Configs.xlsx  configs  kubernetes_config.json  rcar_mmlab                                thirdparty              work_dir
MLProject                data     latency_models.csv      resnet18_8xb32_in1k_20210831-fbbb1da6.pth  thirdparty_models
README.md                docker   mmpretrain              scripts                                   tmp
RenesasUserConfig.json   docs     pyproject.toml          tests                                     tvm_heuristic_partition
root@ken-VirtualBox:/workspace#
```

Mmpretrain 폴더 경로 및 해당 파일 확인

/workspace/mmpretrain/mmpretrain/configs/resnet/resnet18_8xb32_in1k.py

```
root@ken-VirtualBox:/workspace/mmpretrain/mmpretrain/configs/resnet# pwd
/workspace/mmpretrain/mmpretrain/configs/resnet
root@ken-VirtualBox:/workspace/mmpretrain/mmpretrain/configs/resnet# ls
resnet18_8xb32_in1k.py
root@ken-VirtualBox:/workspace/mmpretrain/mmpretrain/configs/resnet#
```

#MODEL_URL

폴더이동후(/workspace) 다운로드

cd /workspace/

wget https://download.openmmlab.com/mmclassification/v0/resnet/resnet18_8xb32_in1k_20210831-fbbb1da6.pth

```
root@ken-VirtualBox:/workspace/mmpretrain/mmpretrain/configs/resnet# cd /workspace/
root@ken-VirtualBox:/workspace# wget https://download.openmmlab.com/mmclassification/v0/resnet/resnet18_8xb32_in1k_20210831-fbbb1da6.pth
--2024-05-02 07:27:52--  https://download.openmmlab.com/mmclassification/v0/resnet/resnet18_8xb32_in1k_20210831-fbbb1da6.pth
Resolving download.openmmlab.com (download.openmmlab.com)... 39.125.80.37, 39.125.80.43, 39.125.80.36, ...
Connecting to download.openmmlab.com (download.openmmlab.com)|39.125.80.37|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 46854589 (45M) [application/octet-stream]
Saving to: 'resnet18_8xb32_in1k_20210831-fbbb1da6.pth.1'

resnet18_8xb32_in1k_20210831-fbbb1da6.pth.1 100%[=========================================================================================>]  44.68M  11.2MB/s    in 4.0s

2024-05-02 07:27:56 (11.2 MB/s) - 'resnet18_8xb32_in1k_20210831-fbbb1da6.pth.1' saved [46854589/46854589]

root@ken-VirtualBox:/workspace#
```

resnet18_8xb32_in1k_20210831-fbbb1da6.pth 파일 확인

#실행결과

```
root@ken-VirtualBox:/workspace# export MODEL_CFG='/workspace/mmpretrain/configs/resnet/resnet101_8xb32_in1k.py'
root@ken-VirtualBox:/workspace# export MODEL_URL='/workspace/resnet18_8xb32_in1k_20210831-fbbb1da6.pth'
root@ken-VirtualBox:/workspace# python3 rcar_mmlab/run.py configs/pytorch.py ${MODEL_CFG} ${MODEL_URL} --deploy-cfg-options 'subset=100'
INFO:rcar_mmlab.evaluate.mmlab:Start evaluate
05/02 07:58:55 - mmengine - WARNING - Failed to search registry with scope "mmpretrain" in the "Codebases" registry tree. As a workaround, the current "Codebases" registr
y in "mmdeploy" is used to build instance. This may cause unexpected failure when running the built modules. Please check whether "mmpretrain" is a correct scope, or whet
her the registry is initialized.
05/02 07:58:55 - mmengine - WARNING - Failed to search registry with scope "mmpretrain" in the "mmpretrain_tasks" registry tree. As a workaround, the current "mmpretrain_
tasks" registry in "mmdeploy" is used to build instance. This may cause unexpected failure when running the built modules. Please check whether "mmpretrain" is a correct
scope, or whether the registry is initialized.
WARNING:rcar_mmlab.evaluate.mmlab:Evaluation data may be duplicated without subset_use_sample=True option
WARNING:rcar_mmlab.evaluate.mmlab:duplicates exist in evaluation_data. key=index,val=num {84: 3, 75: 3, 25: 2, 47: 4, 58: 3, 90: 3, 50: 2, 61: 4, 81: 3, 89: 3, 10: 2, 91:
 2, 96: 3, 86: 2, 80: 2, 54: 4, 39: 2, 66: 2, 32: 2, 87: 2, 44: 2, 8: 3, 70: 2, 57: 2, 18: 2, 92: 2}
Loads checkpoint by local backend from path: /workspace/resnet18_8xb32_in1k_20210831-fbbb1da6.pth
```

```
--------------------
after_test_iter:
(NORMAL      ) IterTimerHook
(NORMAL      ) VisualizationHook
(BELOW_NORMAL) LoggerHook
 --------------------
after_test_epoch:
(VERY_HIGH   ) RuntimeInfoHook
(NORMAL      ) IterTimerHook
(BELOW_NORMAL) LoggerHook
 --------------------
after_test:
(VERY_HIGH   ) RuntimeInfoHook
 --------------------
after_run:
(BELOW_NORMAL) LoggerHook
 --------------------
05/02 07:59:03 - mmengine - INFO - Epoch(test) [100/100]    eta: 0:00:00  time: 0.0597  data_time: 0.0010
05/02 07:59:03 - mmengine - INFO - Epoch(test) [100/100]    accuracy/top1: 0.0000  accuracy/top5: 0.0000  data_time: 0.0023  time: 0.0706
root@ken-VirtualBox:/workspace#
```

Docker 이미지 저장

docker images

```
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# docker images
REPOSITORY       TAG       IMAGE ID       CREATED         SIZE
rcar-mmlab-v4h   root      0cc35bf25256   20 hours ago    17.2GB
rcar-mmlab-v4h   latest    b5e226b8bd25   20 hours ago    17.2GB
<none>           <none>    f46ffe171ab5   2 weeks ago     17.2GB
<none>           <none>    3d4453b8f0a2   2 weeks ago     17.2GB
<none>           <none>    1ca343537308   2 weeks ago     17.2GB
<none>           <none>    df3e966f9676   2 weeks ago     17.2GB
<none>           <none>    054396a80836   2 weeks ago     17.2GB
<none>           <none>    efc7bb728db6   2 weeks ago     17.2GB
<none>           <none>    bfeed7edc913   2 weeks ago     17.2GB
root@ken-VirtualBox:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker#
```

docker save -o v4h_hyco_docker.tar 0cc35bf25256

root@Ubutu20:~/ken/rcar-xos_hyco_v3.24.0_addon_20240401/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# docker save -o v4h.tar 7cabcc78c663

Docker 이미지 로드

Docker load < filename.tar

```
root@Ubuntu20:/media/sf_D_DRIVE/working/hyco# docker load < v4h_hyco_docker.tar
6c3e7df31590: Loading layer [==================================================>]  75.17MB/75.17MB
851dfeb18192: Loading layer [==================================================>]  18.91MB/18.91MB
33e57ea5b30a: Loading layer [==================================================>]  150.7MB/150.7MB
86f0cc586e78: Loading layer [==================================================>]  3.072kB/3.072kB
f344b08ff6c5: Loading layer [==================================================>]  18.94kB/18.94kB
dbd5b7f451e3: Loading layer [=============================================>      ]  2.09GB/2.418GB
```

<중요> 이미지 로드후

docker images 로 ID 를 확인합니다. 그리고 아래와 같이 tag 를 변경해줍니다.

docker tag 0cc35bf25256 rcar-mmlab-v4h:root

```
root@Ubuntu20:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# docker tag 0cc35bf25256 rcar-mmlab-v4h:root
root@Ubuntu20:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# docker images
REPOSITORY       TAG       IMAGE ID       CREATED         SIZE
rcar-mmlab-v4h   root      0cc35bf25256   25 hours ago    17.2GB
```

도커 실행

```
root@Ubuntu20:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# docker tag 0cc35bf25256 rcar-mmlab-v4h:root
root@Ubuntu20:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# docker images
REPOSITORY       TAG       IMAGE ID       CREATED         SIZE
rcar-mmlab-v4h   root      0cc35bf25256   25 hours ago    17.2GB
root@Ubuntu20:/opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/docker# ./run.sh
CEVA_TOOLBOX_ROOT: /opt/CEVA-ToolBox/V22
DATA_DIR_PATH: /opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/data
docker_args: --shm-size=8G --net=host -it --rm --name rcar-mmlab-v4h-root -v /opt/rcar-xos:/opt/rcar-xos -v /opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab:/w
orkspace -v /opt/CEVA-ToolBox/V22:/opt/ceva-toolbox -e CEVA_TOOLBOX_ROOT=/opt/ceva-toolbox -v /opt/rcar-xos/v3.24.0/tools/hyco/models/rcar_mmlab/data:/workspace/
data

==========
== CUDA ==
==========

CUDA Version 11.8.0

Container image Copyright (c) 2016-2023, NVIDIA CORPORATION & AFFILIATES. All rights reserved.

This container image and its contents are governed by the NVIDIA Deep Learning Container License.
By pulling and using the container, you accept the terms and conditions of this license:
https://developer.nvidia.com/ngc/nvidia-deep-learning-container-license

A copy of this license is made available in this container at /NGC-DL-CONTAINER-LICENSE for your convenience.

WARNING: The NVIDIA Driver was not detected.  GPU functionality will not be available.
   Use the NVIDIA Container Toolkit to start this container with GPU support; see
   https://docs.nvidia.com/datacenter/cloud-native/ .

root@Ubuntu20:/workspace#
```

Case 1 :

export MODEL_CFG='https://github.com/open-mmlab/mmpretrain/blob/1.0.0/configs/resnet/resnet101_8xb32_in1k.py'

export MODEL_URL='https://download.openmmlab.com/mmclassification/v0/resnet/resnet18_8xb32_in1k_20210831-fbbb1da6.pth'

실행

python3 rcar_mmlab/run.py configs/pytorch.py ${MODEL_CFG} ${MODEL_URL} --deploy-cfg-options 'subset=100'

결과

```
/opt/venv/lib/python3.8/site-packages/torch/utils/data/dataloader.py:554: UserWarning: This DataLoader will create 5 worker processes in total. Our suggested max
 number of worker in current system is 4, which is smaller than what this DataLoader is going to create. Please be aware that excessive worker creation might get
 DataLoader running slow or even freeze, lower the worker number to avoid potential slowness/freeze if necessary.
  warnings.warn(_create_warning_msg(
05/02 13:58:15 - mmengine - INFO - Epoch(test) [100/100]    eta: 0:00:00  time: 0.0609  data_time: 0.0011
05/02 13:58:15 - mmengine - INFO - Epoch(test) [100/100]    accuracy/top1: 0.0000  accuracy/top5: 1.0000  data_time: 0.0022  time: 0.0658
root@Ubuntu20:/workspace#
```

Case 2:

export MODEL_CFG='/workspace/mmpretrain/configs/resnet/resnet101_8xb32_in1k.py'

export MODEL_URL='/workspace/resnet18_8xb32_in1k_20210831-fbbb1da6.pth'

실행

python3 rcar_mmlab/run.py configs/pytorch.py ${MODEL_CFG} ${MODEL_URL} --deploy-cfg-options 'subset=100'

결과

```
root@Ubuntu20:/workspace# export MODEL_CFG='/workspace/mmpretrain/configs/resnet/resnet101_8xb32_in1k.py'
root@Ubuntu20:/workspace# export MODEL_URL='/workspace/resnet18_8xb32_in1k_20210831-fbbb1da6.pth'
root@Ubuntu20:/workspace# python3 rcar_mmlab/run.py configs/pytorch.py ${MODEL_CFG} ${MODEL_URL} --deploy-cfg-options 'subset=100'
INFO:rcar_mmlab.model_convert.auto:convert: []
INFO:rcar_mmlab.evaluate.mmlab:Start evaluate
05/02 14:06:50 - mmengine - WARNING - Failed to search registry with scope "mmpretrain" in the "Codebases" registry tree. As a workaround, the current "Codebases
" registry in "mmdeploy" is used to build instance. This may cause unexpected failure when running the built modules. Please check whether "mmpretrain" is a corr
ect scope, or whether the registry is initialized.
05/02 14:06:50 - mmengine - WARNING - Failed to search registry with scope "mmpretrain" in the "mmpretrain_tasks" registry tree. As a workaround, the current "mm
pretrain_tasks" registry in "mmdeploy" is used to build instance. This may cause unexpected failure when running the built modules. Please check whether "mmpretr
ain" is a correct scope, or whether the registry is initialized.
WARNING:rcar_mmlab.evaluate.mmlab:Evaluation data may be duplicated without subset_use_sample=True option
WARNING:rcar_mmlab.evaluate.mmlab:duplicates exist in evaluation_data. key=index,val=num {84: 3, 75: 3, 25: 2, 47: 4, 58: 3, 90: 3, 50: 2, 61: 4, 81: 3, 89: 3, 1
0: 2, 91: 2, 96: 3, 86: 2, 80: 2, 54: 4, 39: 2, 66: 2, 32: 2, 87: 2, 44: 2, 8: 3, 70: 2, 57: 2, 18: 2, 92: 2}
/opt/venv/lib/python3.8/site-packages/torch/utils/data/dataloader.py:554: UserWarning: This DataLoader will create 5 worker processes in total. Our suggested max
 number of worker in current system is 4, which is smaller than what this DataLoader is going to create. Please be aware that excessive worker creation might get
 DataLoader running slow or even freeze, lower the worker number to avoid potential slowness/freeze if necessary.
  warnings.warn(_create_warning_msg(
Loads checkpoint by local backend from path: /workspace/resnet18_8xb32_in1k_20210831-fbbb1da6.pth
The model and loaded state dict do not match exactly
```

```
after_run:
(BELOW_NORMAL) LoggerHook
 --------------------
/opt/venv/lib/python3.8/site-packages/torch/utils/data/dataloader.py:554: UserWarning: This DataLoader will create 5 worker processes in total. Our suggested max
 number of worker in current system is 4, which is smaller than what this DataLoader is going to create. Please be aware that excessive worker creation might get
 DataLoader running slow or even freeze, lower the worker number to avoid potential slowness/freeze if necessary.
  warnings.warn(_create_warning_msg(
05/02 14:06:58 - mmengine - INFO - Epoch(test) [100/100]    eta: 0:00:00  time: 0.0609  data_time: 0.0009
05/02 14:06:58 - mmengine - INFO - Epoch(test) [100/100]    accuracy/top1: 0.0000  accuracy/top5: 1.0000  data_time: 0.0026  time: 0.0694
root@Ubuntu20:/workspace#
```

Docker 설치

sudo apt-get update

sudo apt-get install apt-transport-https ca-certificates curl gnupg-agent software-properties-common

curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -

sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable"

sudo apt-get update

sudo apt-get install docker-ce docker-ce-cli containerd.io

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