**DUNE Dependency installation guide**

DUNE makes use of four external Libraries, three Dynamic, one Static.

* **OpenCV** - Dynamic
* **GLFW3** - Dynamic
* **Intel® RealSense™ 2 SDK** - Dynamic
* **GLAD** - Static

GLAD can be found in ./dependencies/glad within the source folder, therefore you are **not** required to download files for GLAD.

Dynamic Libraries are automatically linked by Cmake.

**Install OpenCV**

The release files do not include a .deb file. **Download** the **.tar.gz** file**, extract** itand open **Cmake GUI.** Files to download can be found here, use the **latest release**:

https://github.com/opencv/opencv/releases/

**Configure** Cmake and select any **generator** (**“Unix Makefiles”**, if you do not have other generators). You will see a list of check boxes. Only check the lines that you require. In this case only **C/C++** and **OpenGL** related ones are required.

Click **Build** and open **Terminal** within the **build directory**. Enter the command:

$ sudo make install

Building it will take roughly **30 – 60 minutes**, sit back or get a cup of Coffee while you’re waiting.

The “install” parameter will **automatically install** OpenCV for you.

**Install GLFW**

GLFW3 is available via **Snapshop**, **APT** and most other **Package Managers**.

Find it via package manager by simply entering “glfw” in the **search bar**. Make sure to install the **dev** version! The Package’s full name should be something like “libglfw3-dev”.

If you do **not** have a package manager, install it via **Terminal**; Open it and enter the command:

$ sudo apt-get install libglfw3-dev

or

$ sudo apt install libglfw3-dev

GLFW3 should now be installed and usable.

**Install Intel® RealSense™ 2 SDK (Debian, Ubuntu)**

This library is **not** available via Snapshop and APT, but can be found in **Arch-based package managers.** To install librealsense2, you will need an alternative **Keyserver**. Official Guides and Documents show an **outdated approach** to this, as the **old** links are **deprecated**.

This Guide contains Terminal commands that work **today** (2nd October 2022).

1. First step is to **register** the server’s public **key**:

$ sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-key F6E65AC044F831AC80A06380C8B3A55A6F3EFCDE || sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv-key F6E65AC044F831AC80A06380C8B3A55A6F3EFCDE

1. **Add** the server to the **list of repositories**:

* Ubuntu 20.04 Focal:

$ sudo add-apt-repository "deb https://librealsense.intel.com/Debian/apt-repo focal main"

* Ubuntu 18.04 Bionic:

$ sudo add-apt-repository "deb https://librealsense.intel.com/Debian/apt-repo bionic main"

1. **Update** your package list:

$ sudo apt update

Now **two out of three** librealsense2 libraries should be accessible to you! Library l**ibrealsense2-utils** requires **libssl1.1**, which is **not** automatically installable in Ubuntu 22.04 **Jammy**, as the OS practically **rejects** apt-get install attempts with it.

This can be bypassed by **manually downloading** and **de-packaging** the archived libssl1.1 file.

1. Manually install **libssl1.1**

Open the **Terminal** and go **change directory** to somewhere that allows you to store files to.

Now enter the command:

$ wget http://archive.ubuntu.com/ubuntu/pool/main/o/openssl/libssl1.1\_1.1.1-1ubuntu2.1~18.04.20\_amd64.deb && sudo dpkg -i libssl1.1\_1.1.1-1ubuntu2.1~18.04.20\_amd64.deb && sudo rm libssl1.1\_1.1.1-1ubuntu2.1~18.04.20\_amd64.deb && sudo apt update

This will **automatically** **de-package** and **install** libssl1.1 for you.

1. **Install librealsense2**

Now the Libraries are **open** to the user.

Enter this command in the Terminal to install them:

$ sudo apt install librealsense2-dkms librealsense2-utils librealsense2-dev