The following document is a part of the Vister software developed in collaboration with SDU and LEGO and seek to help the user in setting up the system correctly.

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# Introduction

Vister is an application made to be run on Linux devices. Therefor it is certainly a lot easier to get a hang of how to use it, if you have some prior experience in using Linux. However, probably the most frustrating thing if you are new to Linux is to download and install everything. Hence this document will show you how it is done and where you can find more information if needed.

The following list shows all the libraries that needs to be installed:

* Python
* ROS Noetic Full Desktop
* OpenCV
* Pylon Camera Driver
* Vister

Note: You can open a new Terminal by pressing: CTRL + ALT + T

# How to install Python on Linux

Vister is written in Python 3. Hence, we need to install Python if it is not already installed. Simply open a new Terminal Window and run the following line:

Sudo apt install python3

This will install the latest version of Python. Afterwards it is a good practice to run the two following commands to update and upgrade

Sudo apt update

Sudo apt upgrade

# How to install ROS on Linux

Robot-Operation-System or better known as ROS is also needed. We recommend using the ROS Noetic Full desktop version as you can be sure that all essential packages needed are also installed. ROS has a straightforward guide on how to install it on their website: <http://wiki.ros.org/noetic/Installation/Ubuntu>.

The following information are simply snippets of the commands needed to install ROS Noetic and was taken directly from the above mentioned website.

Run the following commands in a Terminal in this given order:

Setup the source list:

* sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb\_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
* sudo apt install curl # if you haven't already installed curl
* curl -s https://raw.githubusercontent.com/ros/rosdistro/master/ros.asc | sudo apt-key add -
* sudo apt update

Now you can install ROS Noetic Full Desktop by running the following commands:

sudo apt install ros-noetic-desktop-full

## ROS Dependencies for building packages

Vister uses Python3 and therefor we need to install some additional ROS packages for it to work with ROS. Please run the following commands:

sudo apt install python3-rosdep python3-rosinstall python3-rosinstall-generator python3-wstool build-essential

sudo apt install python3-rosdep

sudo rosdep init

rosdep update

You have now installed ROS!

# How To Install OpenCV

OpenCV is also needed for Vister to run. ROS Noetic should also have installed a version of OpenCV, however we suggest that you make sure it is the case by installing it yourself.

You can run the following pip3 command in the Terminal:

pip3 install opencv-contrib-python

it will either begin the installment of OpenCV or update or simply state that it is already installed.

# How To Install Pylon Camera driver

Vister 1.0 is built to work only with a Pylon camera at the moment. Hence, we need to install the right drivers for it to work. This is by far the most difficult for a new Linux user to install as it is done way differently compared to Windows or Mac OS devices.

For the Pylon Camera to work 2 different packages have to be installed. We will first start with the “pylon Camera Software Suite” then the “supplementary packages”.

Follow this link: <https://www.baslerweb.com/en/downloads/software-downloads/>

You want to choose the files that corresponds to the computer system you are using, also make sure you are choosing the .deb file as it is easier to install. In our case the following packages was download and installed.

# How To Install Vister

From the USB-drive containing Vister copy all the source code to a desired directory on your device. First, we must go in and clone our dependencies. To do so we simply must go in and run the following file.

Lego\_WS/src/git.sh

Then you must go back to the source, so you see the following files and folders:

From here you must open a new Terminal Window by right-clicking and pressing “New Terminal Window”. Here you simply run the following command

catkin\_make

This will start the installment process of Vister, which may take a minute or so.

We recommend that you read the “Connecting Vister to the UR ” and “How to use Vister”.

# Sourcing ROS, Pylon and Vister

In order for ROS and Pylon to communicate with each other you have to source both of the directories to the systems path. This ensures while running ROS it will know where to find the Pylon dependencies.

In order to do this, we have to go in and change our ~/.bashcr file.

This file can be found in the following path with “show hidden files” checked.

/home/user/~/.bash

At the end of the file you should add the following lines and save it as .TEX

Source

e

Afterwards you will be ready to use Vister!