CS 6341 Robotics: Instructions on Installing ROS2 on Windows and Mac

Professor Yu Xiang

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1 For Windows Users: using docker

1.1 Step 1: install docker desktop

- Install Docker Desktop `https://docs.docker.com/get-docker/`
- Start the Docker Desktop

1.2 Step 2: run the docker image of ubuntu 24.04

- Ubuntu image information `https://hub.docker.com/_/ubuntu`
- Search "Ubuntu" in Docker Desktop
- Select tag "24.04", and Pull this docker image
- Open a terminal and verify the docker image exists

```
xyfud@YuLaptop MINGW64 ~
$ docker image list
REPOSITORY   TAG       IMAGE ID       CREATED       SIZE
ubuntu       24.04     a08e551cb338   4 weeks ago   117MB
ubuntu       latest    a08e551cb338   4 weeks ago   117MB
```

Figure 1: Show docker images

- Run this command in the terminal:

  ```
  docker run -i -t ubuntu:24.04
  ```

1.3 Step 3: install ROS2 in docker

- Let's use Jazzy Jalisco `https://docs.ros.org/en/jazzy/`

- Select Install -> Ubuntu (deb packages) https://docs.ros.org/en/jazzy/Installation/Ubuntu-Install-Debs.html
- Follow instructions on installing ROS2 above and remove all the "sudo" in the commands

1.4 Step 4: install the terminator terminal in docker

- Run command: `apt install terminator`
- Terminator information https://innovativeinnovation.github.io/ubuntu-setup/terminals/terminator.html

1.5 Step 5: install and start X server in order to have display in docker

- Download and install the VcXsrv Windows X Server from https://sourceforge.net/projects/vcxsrv/
- Follow instructions from here https://medium.com/@potatowagon/how-to-use-gui-apps-in-linux-docker-container-from-windows-host-485d3e1c64a3
- Start the X server
- Check your IP address
- In the docker ubuntu terminal

  `export DISPLAY=my_ip:0.0` (replace my_ip to the actual IP address)

1.6 Step 6: verify your terminator installation

Run command "terminator" in your docker ubuntu terminal. You should see the terminator window.

1.7 Step 7: test the ROS installation with Rviz

- `source /opt/ros/jazzy/setup.bash`
- `rviz2`

1.8 Step 8: we have already installed ROS and terminator. Let's save the docker image for next time

- After you exit the docker container
- Run the command "`docker container list -a`" to see all the containers. Find the container ID of the latest one
- Run the command "`docker container commit <CONTAINER_ID>`"
- Run the command "`docker image list -a`" to see the latest image ID

- Run the command "`docker image tag <IMAGE_ID> TAG`". Give a name to this image such as "ubuntu:ros" Up to now, you have a docker image named "ubuntu:ros" with the installed packages.
- To use this docker image, run the command "`docker run -i -t ubuntu:ros`".

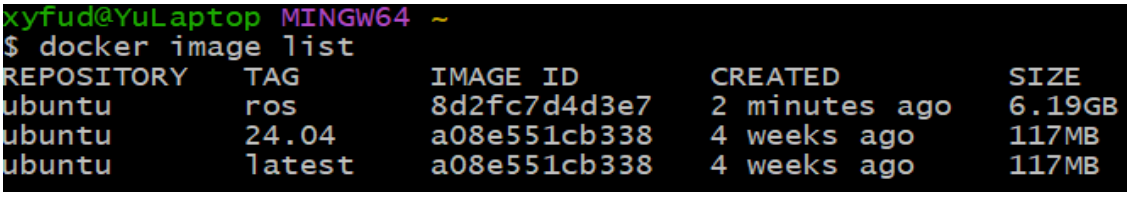

Figure 2: Show docker images with ROS2

Step 8 is an interactive way to install packages into a docker image. You can use these commands to install more packages to your docker image in the future. You can overwrite your docker image by giving the same tag name to it. Then you only need to maintain a single docker image for your project.

2 For Mac Users: using UTM

- Download the ubuntu-24.04.3-desktop-amd64.iso from `https://ubuntu.com/download/desktop` (pick arm or amd based on if you have m1 or intel mac)
- Download UTM from `https://mac.getutm.app/`
- Follow this video `https://www.youtube.com/watch?v=1WWj6qoWhJw`
- Follow steps 3, 4, 6, and 7 in Section 1 to install ROS2 and terminator