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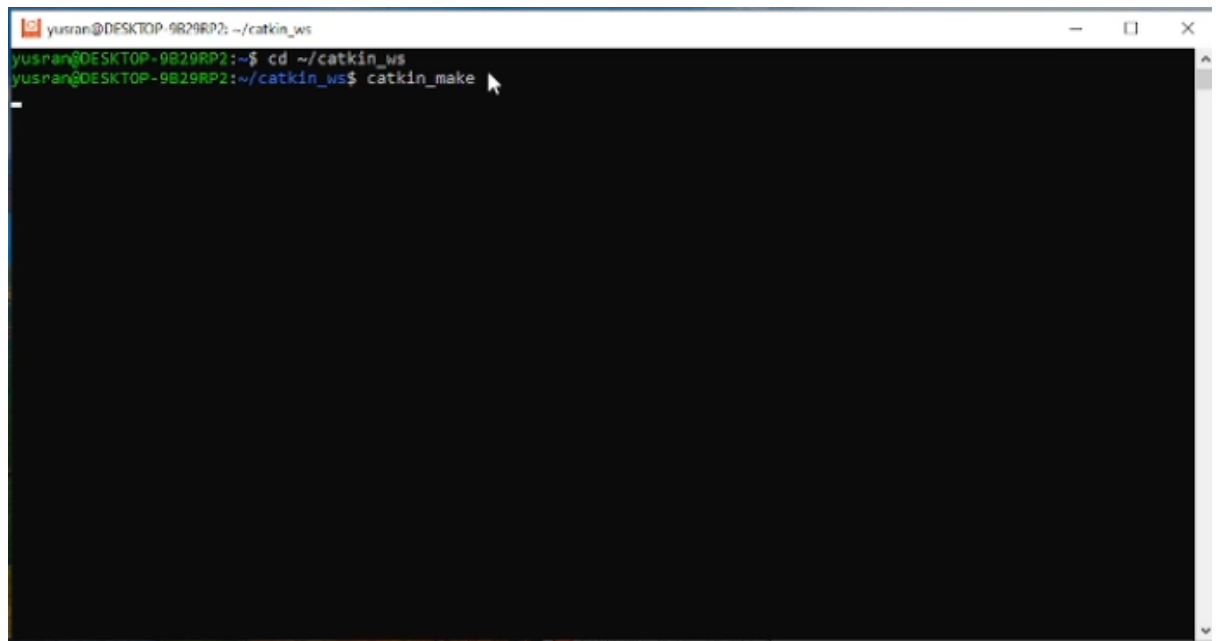
## Laporan Tugas UAS Robotika

Pertama saya mau memberi tau bahwasannya tugas video yang saya buat tidak menggunakan laptop saya sendiri, melainkan menggunakan laptop teman saya, karena laptop saya sendiri sedang mengalami masalah

### 1. Started programming

Pada video ini kita mencoba menghubungkan ros dari client dan server agar bisa terhubung satu sama lain dan mencoba loop program sederhana

Langkah :

A screenshot of a terminal window with a black background and green text. The window title is 'yusran@DESKTOP-9B29RP2: ~/catkin\_ws'. The terminal shows the following commands and their outputs: 'yusran@DESKTOP-9B29RP2:~\$ cd ~/catkin\_ws' followed by a new prompt 'yusran@DESKTOP-9B29RP2:~/catkin\_ws\$ catkin\_make'. A mouse cursor is visible over the second prompt. The rest of the terminal area is empty, indicating the command is still running or the output is not visible in this frame.

```
yusran@DESKTOP-9B29RP2: ~/catkin_ws
yusran@DESKTOP-9B29RP2:~$ cd ~/catkin_ws
yusran@DESKTOP-9B29RP2:~/catkin_ws$ catkin_make
```

Yang pertama dilakukan yaitu masuk kedalam direktori “catkin\_ws” terlebih dahulu dengan command “cd ~/catkin\_ws

Lalu membuat build project untuk menjalankan programnya dengan memasukan command “catkin\_make”

Lalu tunggu hingga proses build catkin selesai

```
roscore http://DESKTOP-9B29RP2:11311/
[100%] Built target demo_msg_publisher
[100%] Built target mastering_ros_demo_pkg_generate_messages
yusran@DESKTOP-9B29RP2:~/catkin_ws$ cd
yusran@DESKTOP-9B29RP2:~$ roscore
... logging to /home/yusran/.ros/log/de4e4a8a-ca06-11ef-a8b4-83d02f4775eb/roslaunch-DESKTOP-9B29RP2-8655.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://DESKTOP-9B29RP2:35055/
ros_comm version 1.17.0

SUMMARY
*****

PARAMETERS
 * /roscore: noetic
 * /rosversion: 1.17.0

NODES

auto-starting new master
process[master]: started with pid [8663]
ROS_MASTER_URI=http://DESKTOP-9B29RP2:11311/

setting /run_id to de4e4a8a-ca06-11ef-a8b4-83d02f4775eb
process[roscout-1]: started with pid [8673]
started core service [/roscout]
```

Setelah itu jalankan roscore nya dengan memasukan command “roscore”

```
yusran@DESKTOP-9B29RP2: ~$ roslaunch mastering_ros_demo_pkg demo_topic_publisher
[ INFO] [1735931652.741915402]: 0
[ INFO] [1735931652.841983100]: 1
[ INFO] [1735931652.942512398]: 2
[ INFO] [1735931653.042128696]: 3
[ INFO] [1735931653.142493194]: 4
[ INFO] [1735931653.241976692]: 5
[ INFO] [1735931653.342623790]: 6
[ INFO] [1735931653.442555487]: 7
[ INFO] [1735931653.542210385]: 8
[ INFO] [1735931653.641990583]: 9
[ INFO] [1735931653.741961481]: 10
[ INFO] [1735931653.841972479]: 11
[ INFO] [1735931653.943005477]: 12
[ INFO] [1735931654.042475974]: 13
[ INFO] [1735931654.141994672]: 14
[ INFO] [1735931654.242008270]: 15
[ INFO] [1735931654.341983668]: 16
[ INFO] [1735931654.442255466]: 17
[ INFO] [1735931654.542492264]: 18
[ INFO] [1735931654.641974761]: 19
[ INFO] [1735931654.741979459]: 20
[ INFO] [1735931654.842702957]: 21
[ INFO] [1735931654.941994155]: 22
[ INFO] [1735931655.042696753]: 23
[ INFO] [1735931655.142744751]: 24
[ INFO] [1735931655.242007249]: 25
[ INFO] [1735931655.341986346]: 26
```

Setelah itu jalankan program nya dengan memasukan command “roslaunch mastering\_ros\_demo\_pkg demo\_topic\_publisher” pada program ini hanya menghitung angka saja

```
yusran@DESKTOP-9B29RP2: ~$ roslaunch mastering_ros_demo_pkg demo_topic_subscriber
[ INFO ] [1735931662.543225221]: Received [98]
[ INFO ] [1735931662.645304519]: Received [99]
[ INFO ] [1735931662.742774818]: Received [100]
[ INFO ] [1735931662.842702116]: Received [101]
[ INFO ] [1735931662.9436988914]: Received [102]
```

Lalu masukan command “roslaunch mastering\_ros\_demo\_pkg demo\_topic\_publisher” pada program ini akan menerima data dari program sebelumnya

```
yusran@DESKTOP-9B29RP2: ~$ roslaunch mastering_ros_demo_pkg demo_msg_publisher
[ INFO ] [1735931685.634480613]: 0
[ INFO ] [1735931685.650286313]: hello world
[ INFO ] [1735931685.735168613]: 1
[ INFO ] [1735931685.735610813]: hello world
[ INFO ] [1735931685.834441514]: 2
[ INFO ] [1735931685.834608914]: hello world
```

Lalu masukan command “roslaunch mastering\_ros\_demo\_pkg demo\_pkg\_publisher” pada program ini mengirimkan pesan yang nantinya akan diterima dan di balas oleh server

```
yusran@DESKTOP-9829RP2:~$ roslaunch mastering_ros_demo_pkg demo_msg_subscriber
[ INFO] [1735931693.336044750]: Recieved greeting [hello world ]
[ INFO] [1735931693.340808850]: Recieved [77]
[ INFO] [1735931693.440183553]: Recieved greeting [hello world ]
[ INFO] [1735931693.441255253]: Recieved [78]
[ INFO] [1735931693.538258955]: Recieved greeting [hello world ]
[ INFO] [1735931693.538441555]: Recieved [79]
[ INFO] [1735931693.635921158]: Recieved greeting [hello world ]
[ INFO] [1735931693.636083958]: Recieved [80]
```

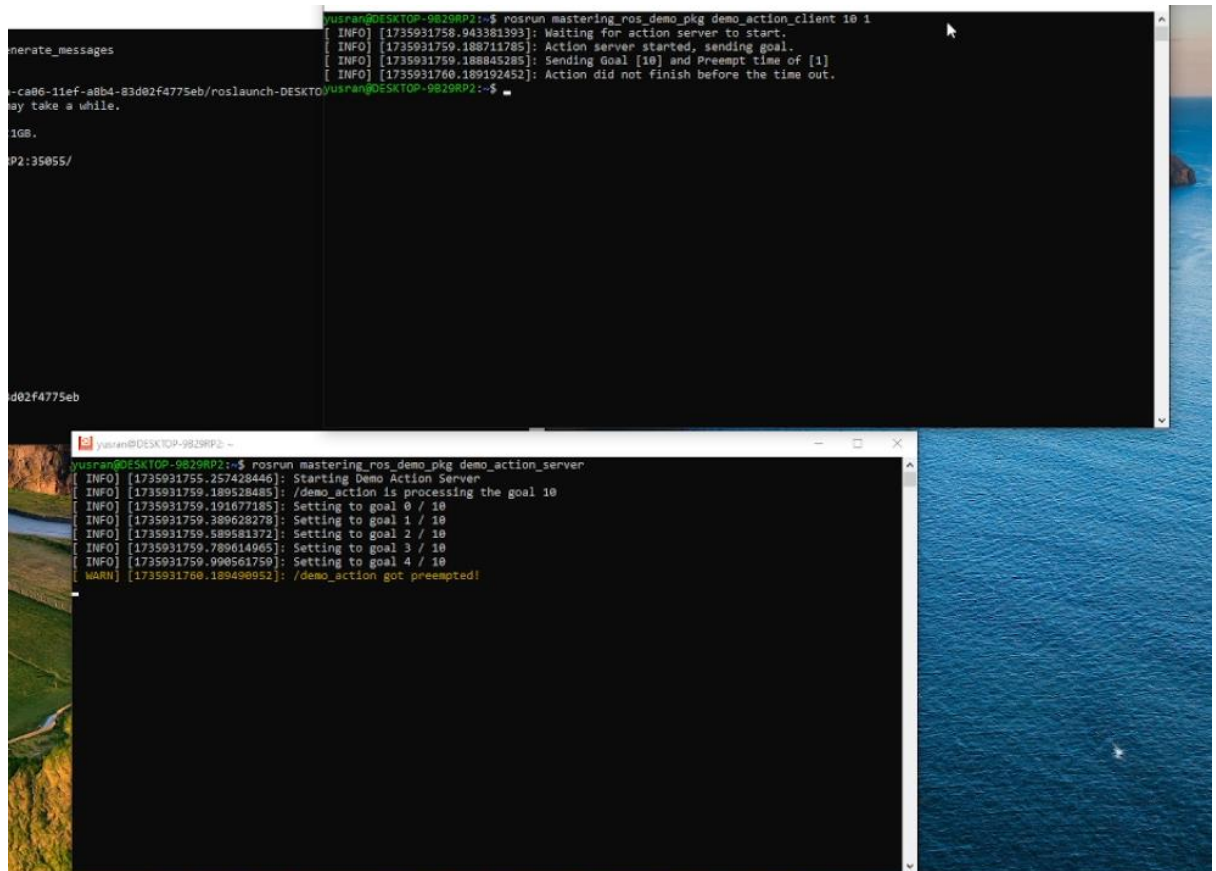
Masukan command “roslaunch mastering\_ros\_demo\_pkg demo\_msg\_subscriber” pada program ini menerima dan membalas dari clientnya

```
yusran@DESKTOP-9829RP2:~$ roslaunch mastering_ros_demo_pkg demo_service_server
[ INFO] [1735931717.814078202]: Ready to receive from client.
[ INFO] [1735931724.645881489]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931724.714826489]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931724.814494489]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931724.914447589]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931725.014277789]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931725.116493689]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931725.216819889]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931725.315422789]: From Client [Sending from Here], Server says [Received Here]

yusran@DESKTOP-9829RP2:~$ roslaunch mastering_ros_demo_pkg demo_service_client
[ INFO] [1735931724.646648389]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931724.715190889]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931724.814934589]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931724.914845789]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931725.014834189]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931725.116907189]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931725.216412989]: From Client [Sending from Here], Server says [Received Here]
[ INFO] [1735931725.315832389]: From Client [Sending from Here], Server says [Received Here]
```

Pada program ini jika client belum mengirimkan sinyal untuk dikirim ke server, server tidak akan berjalan atau tidak akan bisa menerima apa-apa sampai client mengirimkan data. Command server “roslaunch mastering\_ros\_demo\_pkg

demo\_service\_server, Command client "roslaunch mastering\_ros\_demo\_pkg demo\_service\_client"



```
yusran@DESKTOP-9B29RP2:~$ roslaunch mastering_ros_demo_pkg demo_action_client 10 1
[INFO] [1735931750.943381393]: Waiting for action server to start.
[INFO] [1735931750.188711785]: Action server started, sending goal.
[INFO] [1735931750.188845285]: Sending Goal [10] and Preempt time of [1]
[INFO] [1735931760.189192452]: Action did not finish before the time out.
yusran@DESKTOP-9B29RP2:~$
```

```
yusran@DESKTOP-9B29RP2:~$ roslaunch mastering_ros_demo_pkg demo_action_server
[INFO] [1735931755.257428446]: Starting Demo Action Server
[INFO] [1735931759.189528485]: /demo_action is processing the goal 10
[INFO] [1735931759.191677185]: Setting to goal 0 / 10
[INFO] [1735931759.389628278]: Setting to goal 1 / 10
[INFO] [1735931759.589581372]: Setting to goal 2 / 10
[INFO] [1735931759.789614965]: Setting to goal 3 / 10
[INFO] [1735931759.990561759]: Setting to goal 4 / 10
[WARN] [1735931760.189498952]: /demo_action got preempted!
```

Yang terakhir ini hampir sama seperti sebelumnya jika client belum mengirimkan data ke server, server tidak akan mengirimkan apapun, bedanya adalah pada program ini server yang akan mentrigger client terlebih dahulu. Command client "roslaunch mastering\_ros\_demo\_pkg demo\_action\_client 10 1", Command server "roslaunch mastering\_ros\_demo\_pkg demo\_action\_server"



## 2. 3D Modeling

```
yusran@DESKTOP-9829R92: ~/catkin_ws
-- +++ processing catkin package: 'mastering_ros_demo_pkg'
--> add_subdirectory(mastering_ros_demo_pkg)
-- Using these message generators: gencpp;geneus;genlisp;gennodejs;genpy
-- Generating .msg files for action mastering_ros_demo_pkg/Demo_action /home/yusran/catkin_ws/src/mastering_ros_demo_
pkg/action/Demo_action.action
-- mastering_ros_demo_pkg: 8 messages, 1 services
-- +++ processing catkin package: 'turtlemove'
--> add_subdirectory(turtlemove)
-- +++ processing catkin package: 'mastering_ros_robot_description_pkg'
--> add_subdirectory(mastering_ros_robot_description_pkg)
-- Using these message generators: gencpp;geneus;genlisp;gennodejs;genpy
-- Configuring done
CMake Warning (dev) at Probabilistic-Roadmap/src/rrt-planning/CMakeLists.txt:204 (add_dependencies):
Policy CMP0046 is not set: Error on non-existent dependency in
add_dependencies. Run "cmake --help-policy CMP0046" for policy details.
Use the cmake_policy command to set the policy and suppress this warning.

The dependency target "ros_rrt_generate_messages_cpp" of target "prm" does
not exist.
This warning is for project developers. Use -Wno-dev to suppress it.

-- Generating done
-- Build files have been written to: /home/yusran/catkin_ws/build
make
make Running command: "make -j4 -l4" in "/home/yusran/catkin_ws/build"
make
[ 3%] Built target prm
[ 3%] Built target std_msgs_generate_messages_cpp
[ 3%] Built target actionlib_msgs_generate_messages_cpp
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_demo_srv
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionActionResult
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_demo_msg
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionAction
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionActionGoal
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionActionFeedback
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionGoal
[ 6%] Built target demo_topic_subscriber
[ 6%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionResult
[ 9%] Built target demo_topic_publisher
[ 9%] Built target std_msgs_generate_messages_eus
[ 9%] Built target std_msgs_generate_messages_lisp
[ 9%] Built target actionlib_msgs_generate_messages_eus
[ 9%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionFeedback
[ 9%] Built target actionlib_msgs_generate_messages_lisp
[ 9%] Built target std_msgs_generate_messages_py
[ 9%] Built target std_msgs_generate_messages_nodejs
[ 9%] Built target actionlib_msgs_generate_messages_py
Scanning dependencies of target mastering_ros_robot_description_pkg_xacro_generated_to_devel_space_
[ 9%] Built target actionlib_msgs_generate_messages_nodejs
[ 9%] Built target mastering_ros_robot_description_pkg_xacro_generated_to_devel_space_
[24%] Built target mastering_ros_demo_pkg_generate_messages_eus
[37%] Built target mastering_ros_demo_pkg_generate_messages_cpp
[51%] Built target mastering_ros_demo_pkg_generate_messages_lisp
[68%] Built target mastering_ros_demo_pkg_generate_messages_py
[81%] Built target mastering_ros_demo_pkg_generate_messages_nodejs
[84%] Built target demo_msg_publisher
[87%] Built target demo_action_server
[90%] Built target demo_action_client
[93%] Built target demo_service_client
[96%] Built target demo_service_server
[96%] Built target mastering_ros_demo_pkg_generate_messages
[100%] Built target demo_msg_subscriber
yusran@DESKTOP-9829R92: ~/catkin_ws
```

Sebelum menjalankan rviznya kita buatkan build project nya terlebih dahulu dnegan memasukan command “catkin\_make”

```
/home/yusran/catkin_ws/src/mastering_ros_robot_description_pkg/launch/view_demo.launch http://localhost:11311
yusran@DESKTOP-9B29RP2:~$ roslaunch mastering_ros_robot_description_pkg view_demo.launch
.. logging to /home/yusran/.ros/log/31b852aa-ca08-11ef-a8b4-83d02f4775eb/roslaunch-DESKTOP-9B29RP2-9305.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://DESKTOP-9B29RP2:39325/

SUMMARY
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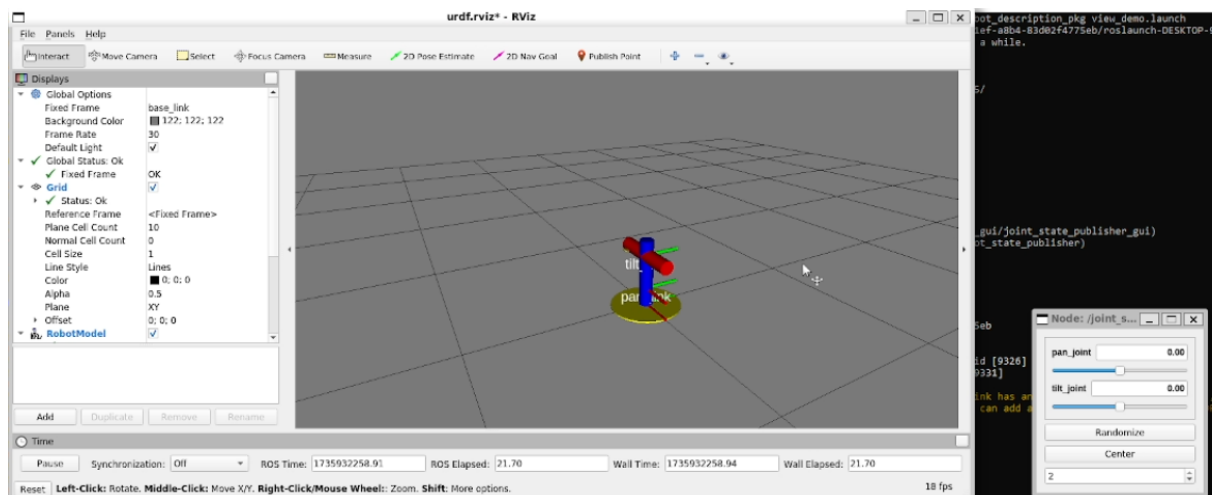
PARAMETERS
* /robot_description: <?xml version="1...
* /roscpp: noetic
* /rosversion: 1.17.0

NODES
/
  joint_state_publisher_gui (joint_state_publisher_gui/joint_state_publisher_gui)
  robot_state_publisher (robot_state_publisher/robot_state_publisher)
  rviz (rviz/rviz)

auto-starting new master
process[master]: started with pid [9313]
ROS_MASTER_URI=http://localhost:11311

setting /run_id to 31b852aa-ca08-11ef-a8b4-83d02f4775eb
process[rosout-1]: started with pid [9323]
started core service [/rosout]
process[joint_state_publisher_gui-2]: started with pid [9326]
process[robot_state_publisher-3]: started with pid [9331]
process[rviz-4]: started with pid [9332]
[WARN] [1735932204.544123603]: The root link base_link has an inertia specified in the URDF, but KDL does not support
a root link with an inertia. As a workaround, you can add an extra dummy link to your URDF.
```

Setelah itu jalankan rviznya dengan memasukan command “roslaunch mastering\_ros\_robot\_description\_pkg view\_demo.launch



Lalu akan muncul robotnya dan tab untuk mengontrol robotnya, pada project saya robotnya tidak me render dengan sempurna

```
/home/yusran/catkin_ws/src/mastering_ros_robot_description_pkg/launch/view_mobile_robot.launch http://localhost:11311
usran@DESKTOP-9B29RP2:~$ roslaunch mastering_ros_robot_description_pkg view_mobile_robot.launch
.. logging to /home/yusran/.ros/log/df73d2a2-ca08-11ef-a8b4-83d02f4775eb/roslaunch-DESKTOP-9B29RP2-9551.log
checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://DESKTOP-9B29RP2:43903/

SUMMARY
-----

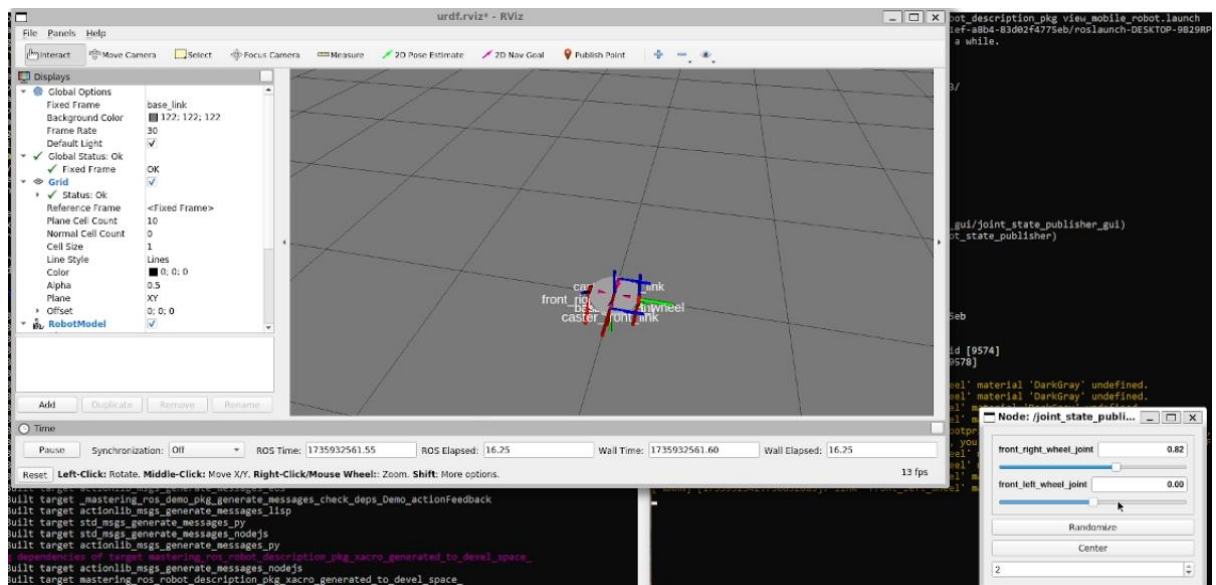
PARAMETERS
* /robot_description: <?xml version="1...
* /roscpp__noetic
* /rosversion: 1.17.0

NODES
/
  joint_state_publisher_gui (joint_state_publisher_gui/joint_state_publisher_gui)
  robot_state_publisher (robot_state_publisher/robot_state_publisher)
  rviz (rviz/rviz)

auto-starting new master
process[master]: started with pid [9561]
ROS_MASTER_URI=http://localhost:11311

setting /run_id to df73d2a2-ca08-11ef-a8b4-83d02f4775eb
process[rosout-1]: started with pid [9571]
started core service [/rosout]
process[joint_state_publisher_gui-2]: started with pid [9574]
process[robot_state_publisher-3]: started with pid [9578]
process[rviz-4]: started with pid [9580]
WARN [1735932500.076014538]: link 'front_right_wheel' material 'DarkGray' undefined.
WARN [1735932500.078156338]: link 'front_right_wheel' material 'DarkGray' undefined.
WARN [1735932500.078421238]: link 'front_left_wheel' material 'DarkGray' undefined.
WARN [1735932500.078556438]: link 'front_left_wheel' material 'DarkGray' undefined.
WARN [1735932500.079017338]: The root link base_footprint has an inertia specified in the URDF, but KDL does not support a root link with an inertia. As a workaround, you can add an extra dummy link to your URDF.
```

Yang kedua ada robot vacuum, untuk menampilkan robot vacuum nya masukan command “roslaunch mastering\_ros\_robot\_description\_pkg view\_mobile\_robot.launch



Pada robot ini kita bisa menggerakkan rodanya ke kiri atau ke kanan



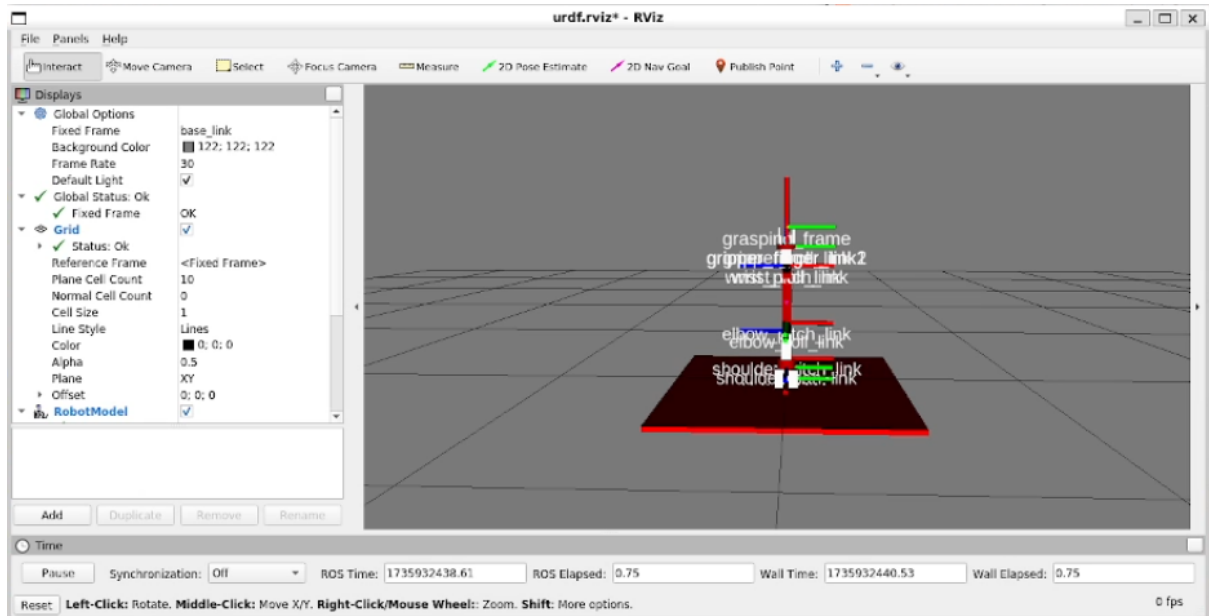
### 3. ROS Moveit

```
yusran@DESKTOP-9829RP2: ~/catkin_ws
-- ++ processing catkin package: 'mastering_ros_demo_pkg'
-- ==> add_subdirectory(mastering_ros_demo_pkg)
-- Using these message generators: gencpp;geneus;genlisp;gennodejs;genpy
-- Generating .msg files for action mastering_ros_demo_pkg/Demo_action /home/yusran/catkin_ws/src/mastering_ros_demo_pkg/action/Demo_action.action
-- mastering_ros_demo_pkg: 8 messages, 1 services
-- ++ processing catkin package: 'turtlemove'
-- ==> add_subdirectory(turtlemove)
-- ++ processing catkin package: 'mastering_ros_robot_description_pkg'
-- ==> add_subdirectory(mastering_ros_robot_description_pkg)
-- Using these message generators: gencpp;geneus;genlisp;gennodejs;genpy
-- Configuring done
CMake Warning (dev) at Probabilistic-Roadmap/src/rrt-planning/CMakeLists.txt:204 (add_dependencies):
Policy CMP0046 is not set: Error on non-existent dependency in
add_dependencies. Run "cmake --help-policy CMP0046" for policy details.
Use the cmake_policy command to set the policy and suppress this warning.

The dependency target "ros_rrt_generate_messages_cpp" of target "prm" does
not exist.
This warning is for project developers. Use -Wno-dev to suppress it.

-- Generating done
-- Build files have been written to: /home/yusran/catkin_ws/build
***
*** Running command: "make -j4 -l4" in "/home/yusran/catkin_ws/build"
***
[ 3%] Built target prm
[ 3%] Built target std_msgs_generate_messages_cpp
[ 3%] Built target actionlib_msgs_generate_messages_cpp
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_demo_srv
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionActionResult
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_demo_msg
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionAction
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionActionGoal
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionActionFeedback
[ 3%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionGoal
[ 6%] Built target demo_topic_subscriber
[ 6%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionResult
[ 9%] Built target demo_topic_publisher
[ 9%] Built target std_msgs_generate_messages_eus
[ 9%] Built target std_msgs_generate_messages_lisp
[ 9%] Built target actionlib_msgs_generate_messages_eus
[ 9%] Built target mastering_ros_demo_pkg_generate_messages_check_deps_Demo_actionFeedback
[ 9%] Built target actionlib_msgs_generate_messages_lisp
[ 9%] Built target std_msgs_generate_messages_py
[ 9%] Built target std_msgs_generate_messages_nodejs
[ 9%] Built target actionlib_msgs_generate_messages_py
Scanning dependencies of target mastering_ros_robot_description_pkg_xacro_generated_to_devel_space_
[ 9%] Built target actionlib_msgs_generate_messages_nodejs
[ 9%] Built target mastering_ros_robot_description_pkg_xacro_generated_to_devel_space_
[24%] Built target mastering_ros_demo_pkg_generate_messages_eus
[37%] Built target mastering_ros_demo_pkg_generate_messages_cpp
[51%] Built target mastering_ros_demo_pkg_generate_messages_lisp
[68%] Built target mastering_ros_demo_pkg_generate_messages_py
[81%] Built target mastering_ros_demo_pkg_generate_messages_nodejs
[84%] Built target demo_msg_publisher
[87%] Built target demo_action_server
[90%] Built target demo_action_client
[93%] Built target demo_service_client
[96%] Built target demo_service_server
[96%] Built target mastering_ros_demo_pkg_generate_messages
[100%] Built target demo_msg_subscriber
```

Sebelum mulai kita buat build projectnya terlebih dahulu dengan memasukan command “catkin\_make”



Setelah itu langsung jalankan rviznya dengan memasukkan command “roslaunch seven\_dof\_arm\_test test\_random\_node”, pada laptop saya robot tidak render dengan sempurna, robot akan bergerak secara otomatis