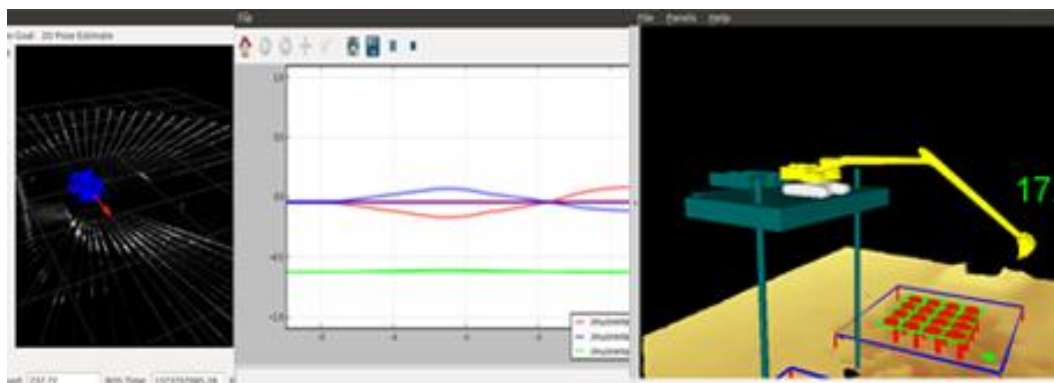
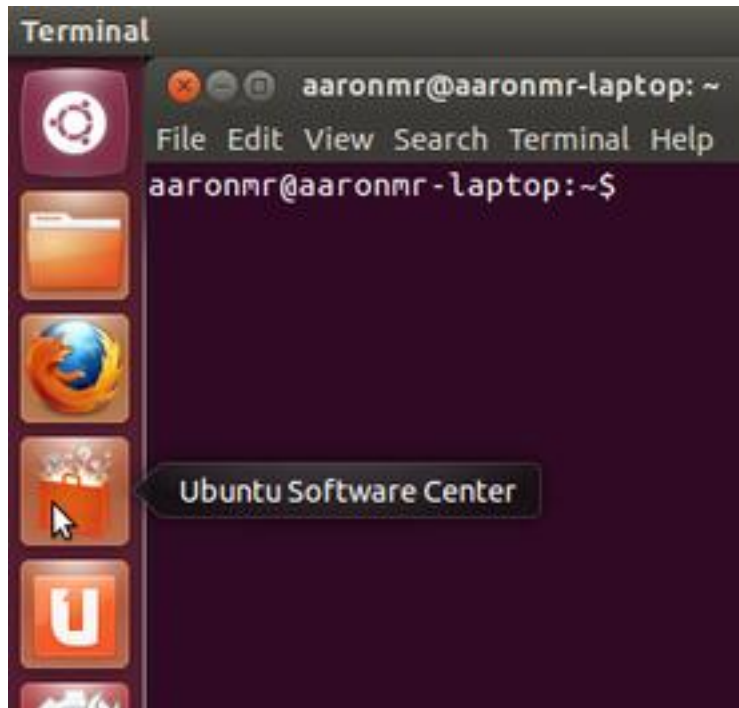
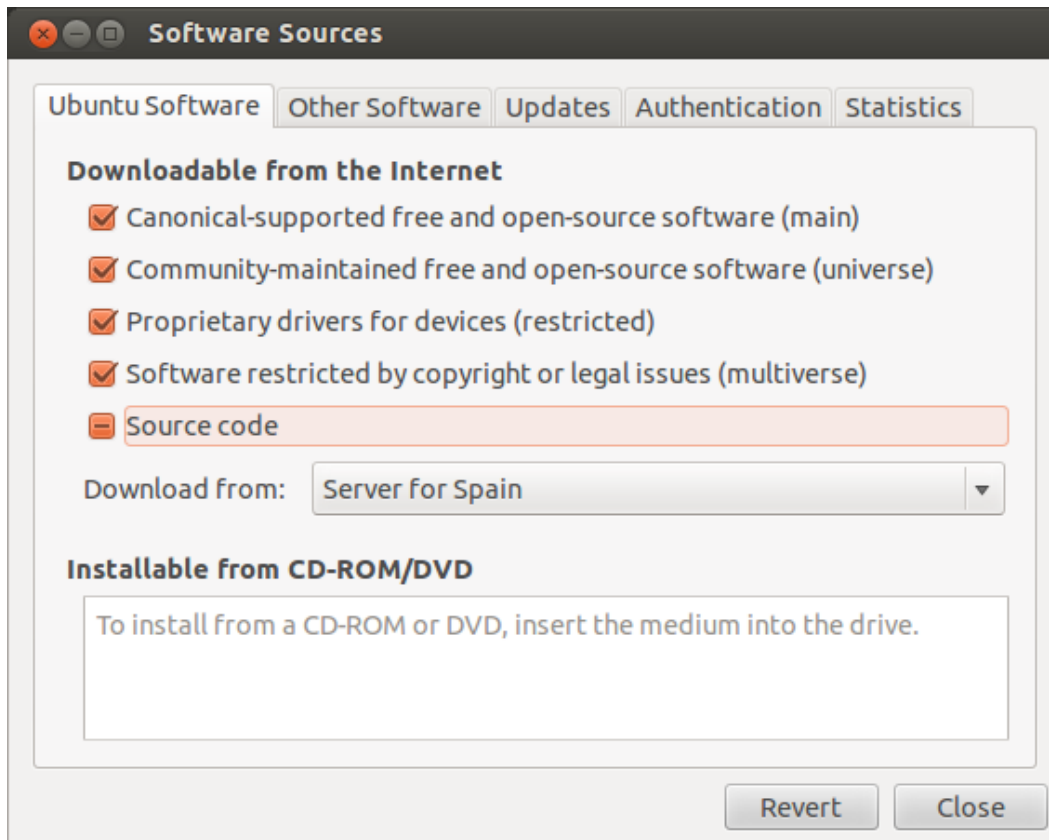


Chapter 1: Getting Started with ROS








File Machine Help

New Settings Start Discard

Name and operating system

Please choose a descriptive name for the new virtual machine and select the type of operating system you intend to install on it. The name you choose will be used throughout VirtualBox to identify this machine.

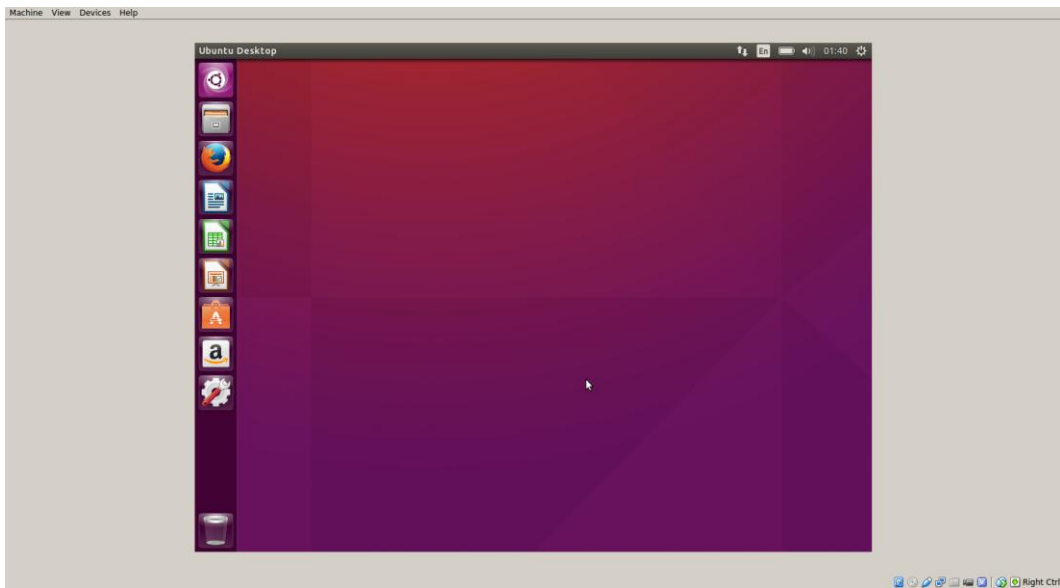
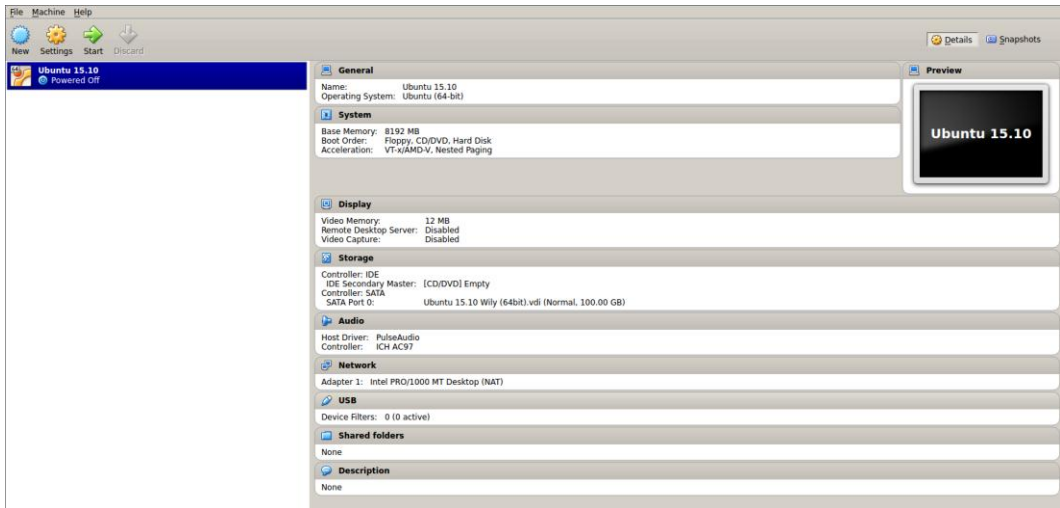
Name:

Type: 

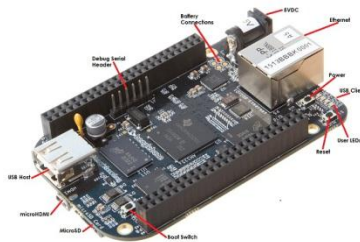
Version:

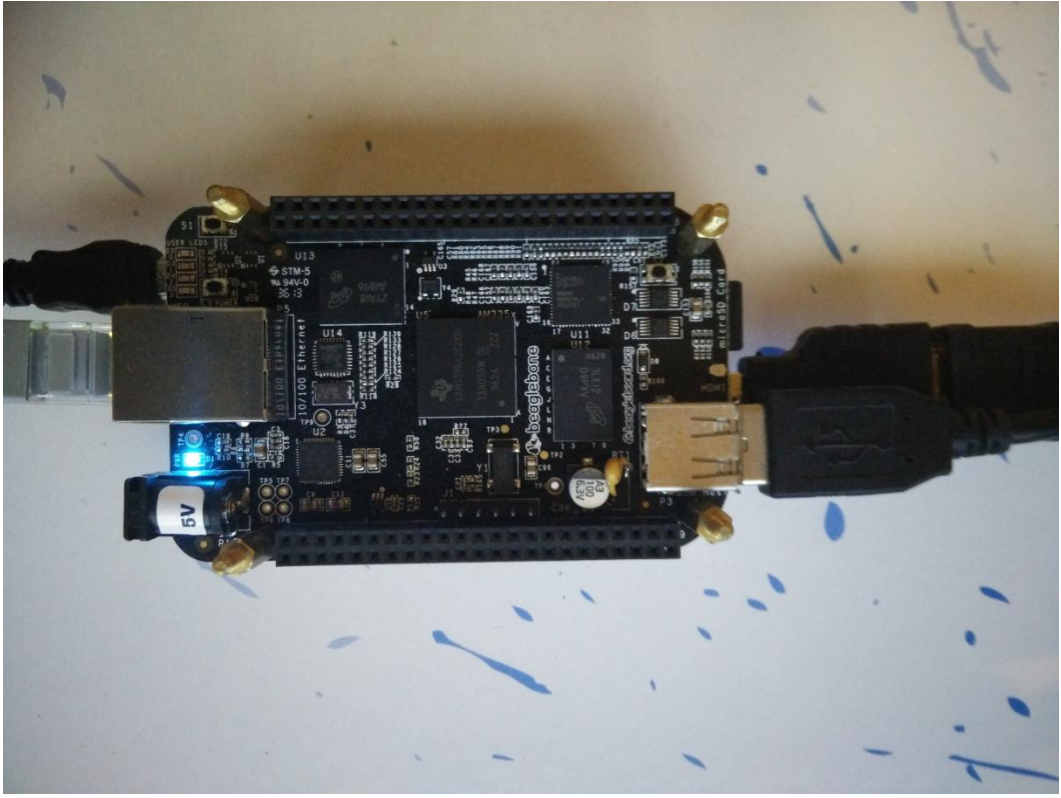
Hide Description < Back Next > Cancel



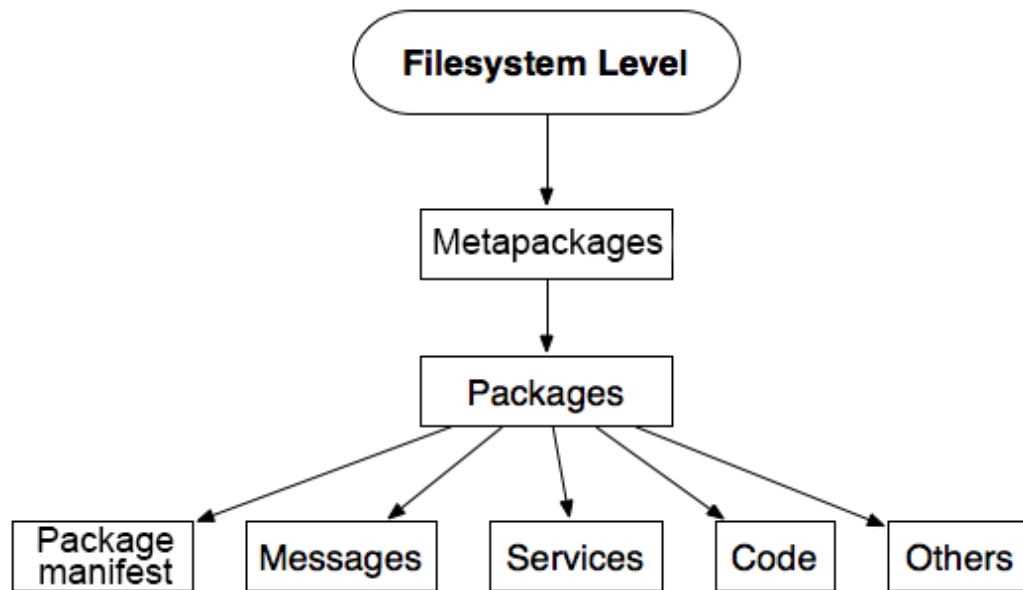


```
~$ docker pull ros
FATA[0000] Post http://var/run/docker.sock/v1.18/images/create?fromImage=ros%3
Alatest: dial unix /var/run/docker.sock: permission denied. Are you trying to c
onnect to a TLS-enabled daemon without TLS?
~$ docker pull ros
latest: Pulling from ros
808ef855e5b6: Pull complete
267903aa9bd1: Pull complete
d28d8a6a946d: Pull complete
ab035c88d533: Pull complete
0b409bffffca0: Pull complete
aa8ec2450c6b: Pull complete
fea18d173ca4: Pull complete
5c9bb5cbe512: Pull complete
ae87b758dd0d: Pull complete
9cadeb3affd3: Pull complete
9c28b2d84bd7: Pull complete
0c7cd879039b: Pull complete
e8530b0325b8: Pull complete
8ab2cb273ccb: Pull complete
c7411052df49: Pull complete
ec05b0e2ef74: Pull complete
c366f9bb95b3: Pull complete
e795c4487953: Pull complete
Digest: sha256:078fbd221da8a3126eff2e283655f5a58e0342de272e38ef94631a1017568b86
Status: Downloaded newer image for ros:latest
```





Chapter 2: ROS Architecture and Concepts



```
└─ turtlesim
  ├── CHANGELOG.rst
  ├── CMakeLists.txt
  ├── images
  │   └── kinetic.png
  ├── include
  │   └── turtlesim
  ├── launch
  │   └── multisim.launch
  ├── msg
  │   ├── Color.msg
  │   └── Pose.msg
  ├── package.xml
  ├── src
  │   ├── turtle.cpp
  │   ├── turtle_frame.cpp
  │   ├── turtlesim
  │   └── turtlesim.cpp
  └── srv
      ├── Kill.srv
      ├── SetPen.srv
      ├── Spawn.srv
      ├── TeleportAbsolute.srv
      └── TeleportRelative.srv
```

```
└─ catkin_ws
  └─ build
    ├── catkin
    ├── catkin_generated
    ├── Makefile
    └─ ...
  └─ devel
    ├── setup.zsh
    └─ ...
  └─ src
    ├── CMakeLists.txt -> /opt/ros/kinetic/share/catkin/cmake/toplevel.cmake
    └─ ...
```

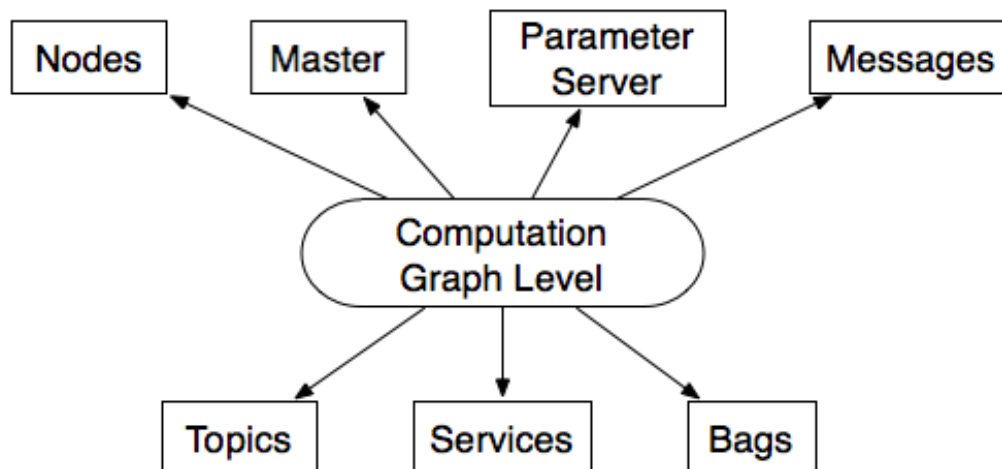
```
<?xml version="1.0"?>
<package>
  <name>example</name>
  <version>0.0.1</version>
  <description>
    this is a example.
  </description>
  <maintainer email="test@test.com">test</maintainer>
  <license>BSD</license>

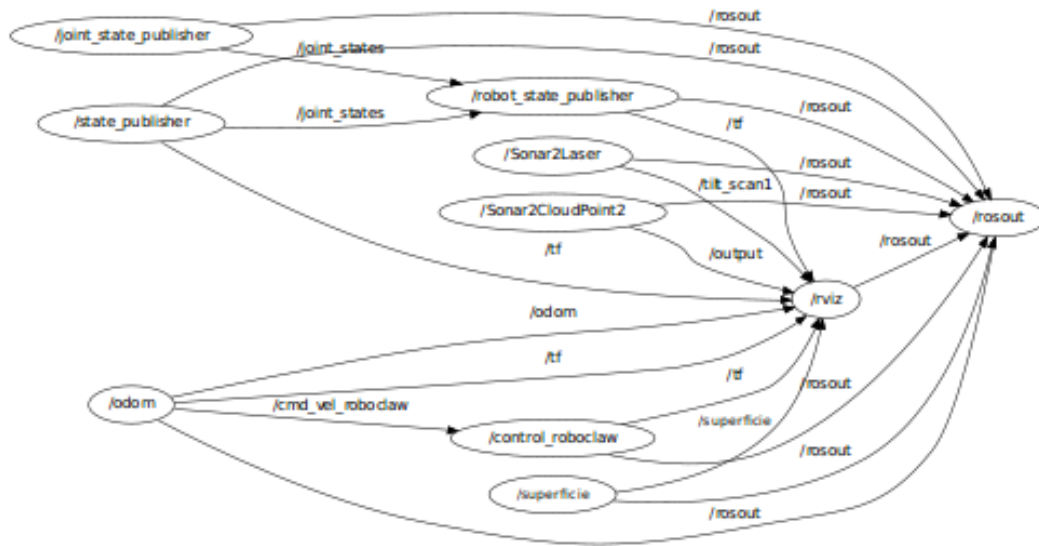
  <url type="website">http://www.test.com</url>
  <author>test</author>

  <buildtool_depend>catkin</buildtool_depend>
  <build_depend>geometry_msgs</build_depend>

  <run_depend>geometry_msgs</run_depend>
</package>
```

```
<?xml version="1.0"?>
<package>
  ...
  <buildtool_depend>catkin</buildtool_depend>
  ...
  <run_depend>roscpp_tutorials</run_depend>
  <run_depend>rospy_tutorials</run_depend>
  <run_depend>turtlesim</run_depend>
  ...
  <export>
    <metapackage/>
  </export>
  ...
</package>
```





```

Created file chapter2_tutorials/package.xml
Created file chapter2_tutorials/CMakeLists.txt
Created folder chapter2_tutorials/include/chapter2_tutorials
Created folder chapter2_tutorials/src
Successfully created files in /home/aaronmr/dev/catkin_ws/src/chapter2_tutorials. Please adjust the values in package.xml.

```

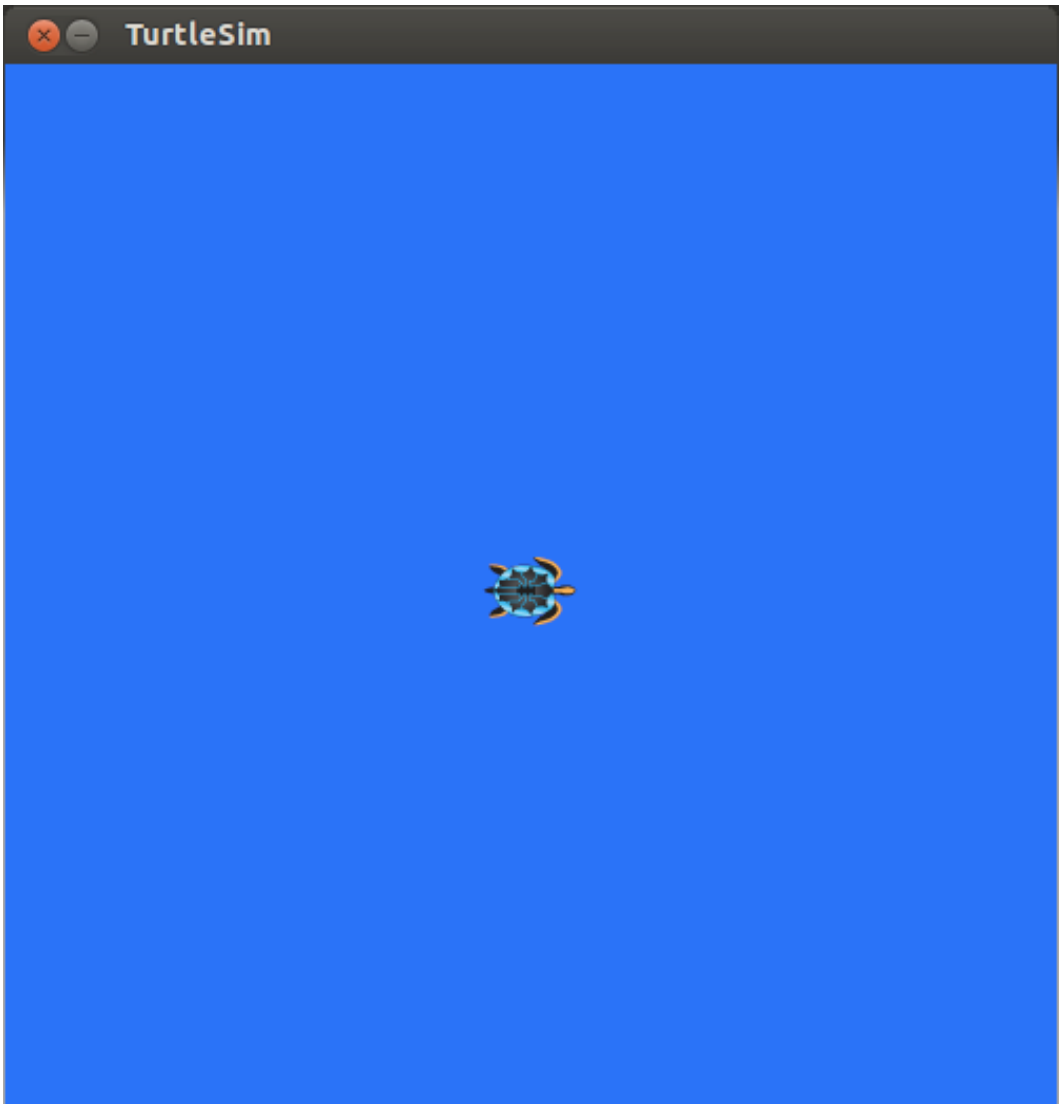
```
...
Base path: /home/aaronmr/dev/catkin_ws
Source space: /home/aaronmr/dev/catkin_ws/src
Build space: /home/aaronmr/dev/catkin_ws/build
Devel space: /home/aaronmr/dev/catkin_ws/devel
Install space: /home/aaronmr/dev/catkin_ws/install
...
-- BUILD_SHARED_LIBS is on
-- ~~~~~
-- ~~ traversing 29 packages in topological order:
-- ~~ - chapter2_tutorials
...
-- ~~~~~
-- +++ processing catkin package: 'chapter2_tutorials'
-- ==> add_subdirectory(chapter2_tutorials)
...
[100%] Built target .....
```

roscpp is a command-line tool for printing information about ROS Nodes.

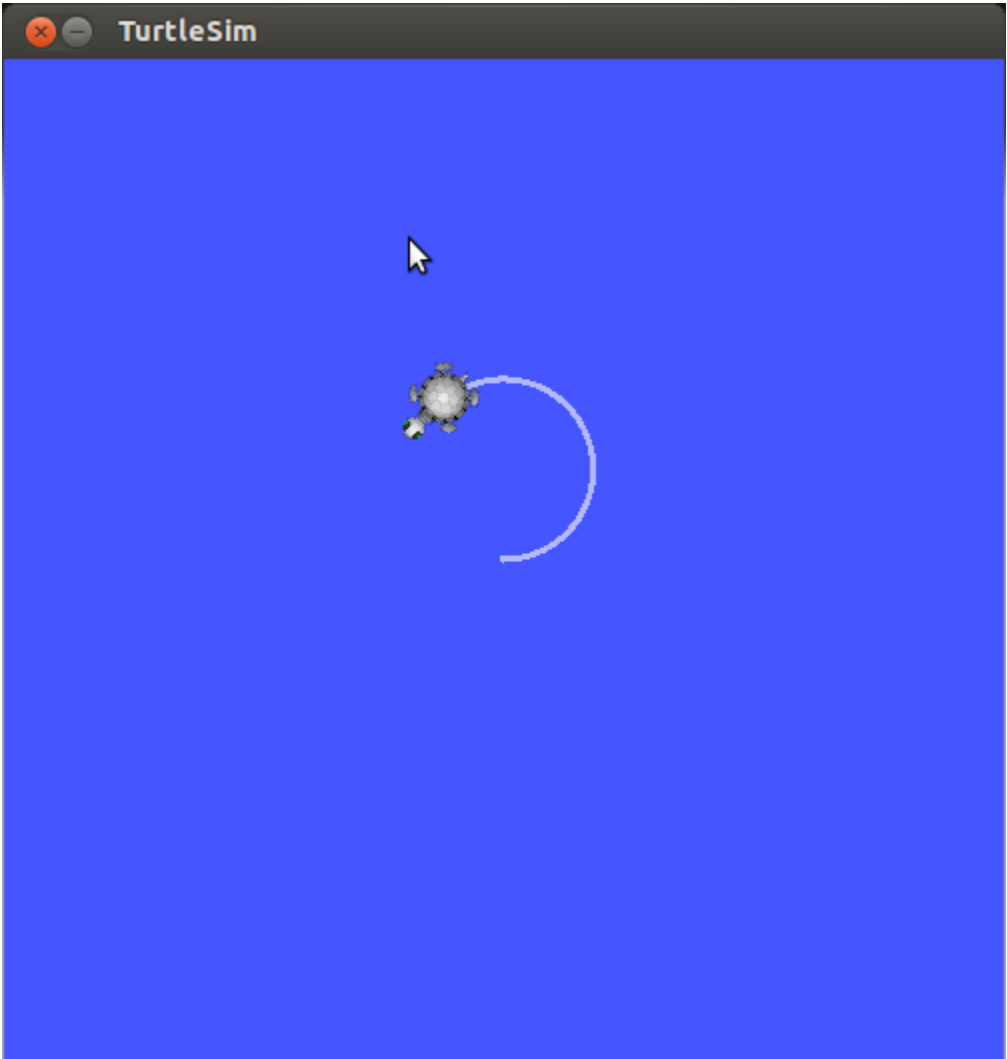
Commands:

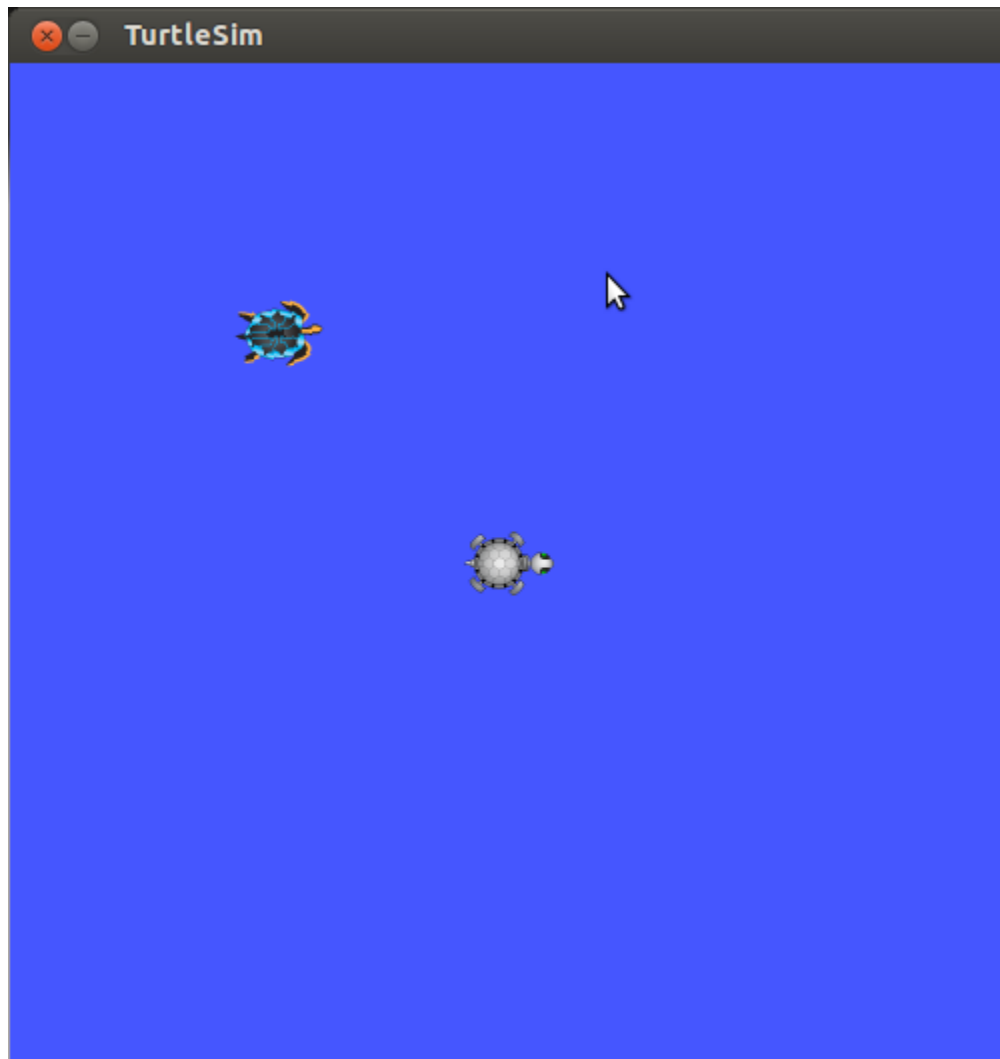
```
roscpp ping      test connectivity to node
roscpp list      list active nodes
roscpp info      print information about node
roscpp machine   list nodes running on a particular machine or list machines
roscpp kill      kill a running node
roscpp cleanup   purge registration information of unreachable nodes
```

Type roscpp <command> -h for more detailed usage, e.g. 'roscpp ping -h'

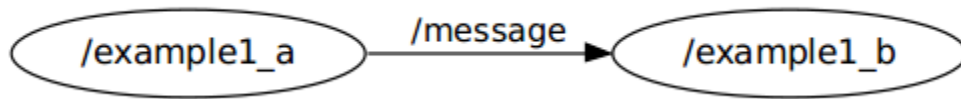








```
...  
[ INFO] [1403252419.452448698]: I heard: [ I am the example1_a node ]  
[ INFO] [1403252419.552163326]: I heard: [ I am the example1_a node ]  
[ INFO] [1403252419.653701929]: I heard: [ I am the example1_a node ]  
[ INFO] [1403252419.752261663]: I heard: [ I am the example1_a node ]  
[ INFO] [1403252419.854459847]: I heard: [ I am the example1_a node ]  
...
```



```
started roslaunch server http://127.0.0.1:40930/

SUMMARY
=====

PARAMETERS
* /roscdistro
* /rosversion

NODES
/
  example1_a (chapter2_tutorials/example1_a)
  example1_b (chapter2_tutorials/example1_b)

auto-starting new master
process[roscdistro]: started with pid [19889]
ROS_MASTER_URI=http://localhost:11311

setting /run_id to b334800a-f940-11e3-989f-080027b05884
process[roscdistro-1]: started with pid [19902]
started core service [/roscdistro]
process[example1_a-2]: started with pid [19914]
process[example1_b-3]: started with pid [19925]
```

```
/example1_a
/example1_b
/roscdistro
```

rqt_console__Console - rqt

Console

Displaying 601 messages

Fit Columns

#	Message	Severity	Node	Stamp	Topics
#601	I heard: [I am the example1_a node]	Info	/example1_b	13:40:09.132487043 (2014-06-21)	/rosout /home/aaronmr/de
#600	I heard: [I am the example1_a node]	Info	/example1_b	13:40:09.031280032 (2014-06-21)	/rosout /home/aaronmr/de
#599	I heard: [I am the example1_a node]	Info	/example1_b	13:40:08.932508626 (2014-06-21)	/rosout /home/aaronmr/de

rqt_reconfigure__Param - rqt

Dynamic Reconfigure

Filter key:

example4

/example4

int_param 0 100

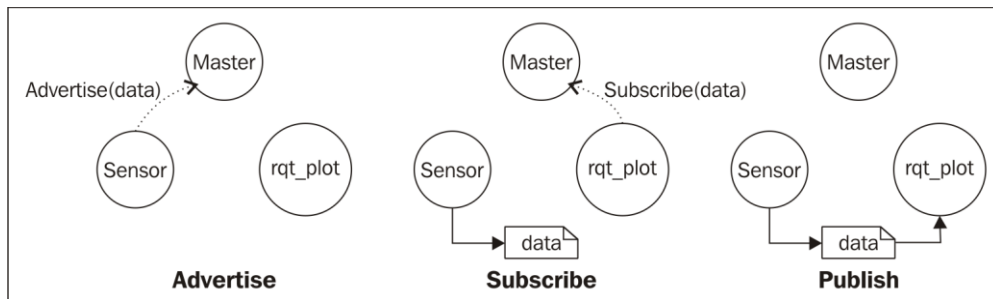
double_param 0.0 1.0

str_param

bool_param

size

```
[ INFO] [1403367196.752115948]: Reconfigure Request: 20 0.800000 qwert True 1
[ INFO] [1403367196.942722848]: Reconfigure Request: 20 0.800000 qwerty True 1
[ INFO] [1403367196.973132691]: Reconfigure Request: 20 0.800000 qwerty True 1
[ INFO] [1403367197.183714401]: Reconfigure Request: 20 0.800000 qwertyu True 1
[ INFO] [1403367197.217819018]: Reconfigure Request: 20 0.800000 qwertyu True 1
[ INFO] [1403367203.160337570]: Reconfigure Request: 1 0.800000 qwertyu True 1
[ INFO] [1403367203.188864110]: Reconfigure Request: 1 0.800000 qwertyu True 1
```

```

-----
Node [/turtlesim]
Publications:
 * /turtle1/color_sensor [turtlesim/Color]
 * /rosout [roscpp_msgs/Log]
 * /turtle1/pose [turtlesim/Pose]

Subscriptions:
 * /turtle1/cmd_vel [geometry_msgs/Twist]

Services:
 * /turtle1/teleport_absolute
 * /turtlesim/get_loggers
 * /turtlesim/set_logger_level
 * /reset
 * /spawn
 * /clear
 * /turtle1/set_pen
 * /turtle1/teleport_relative
 * /kill

contacting node http://daneel:38674/ ...
Pid: 3881
Connections:
 * topic: /rosout
   * to: /rosout
   * direction: outbound
   * transport: TCPROS
 * topic: /turtle1/cmd_vel
   * to: /teleop_turtle (http://daneel:44645/)
   * direction: inbound
   * transport: TCPROS

```

```
-----  
Node [/teleop_turtle]  
Publications:  
* /turtle1/cmd_vel [geometry_msgs/Twist]  
* /rosout [roscpp_msgs/Log]
```

```
Subscriptions: None
```

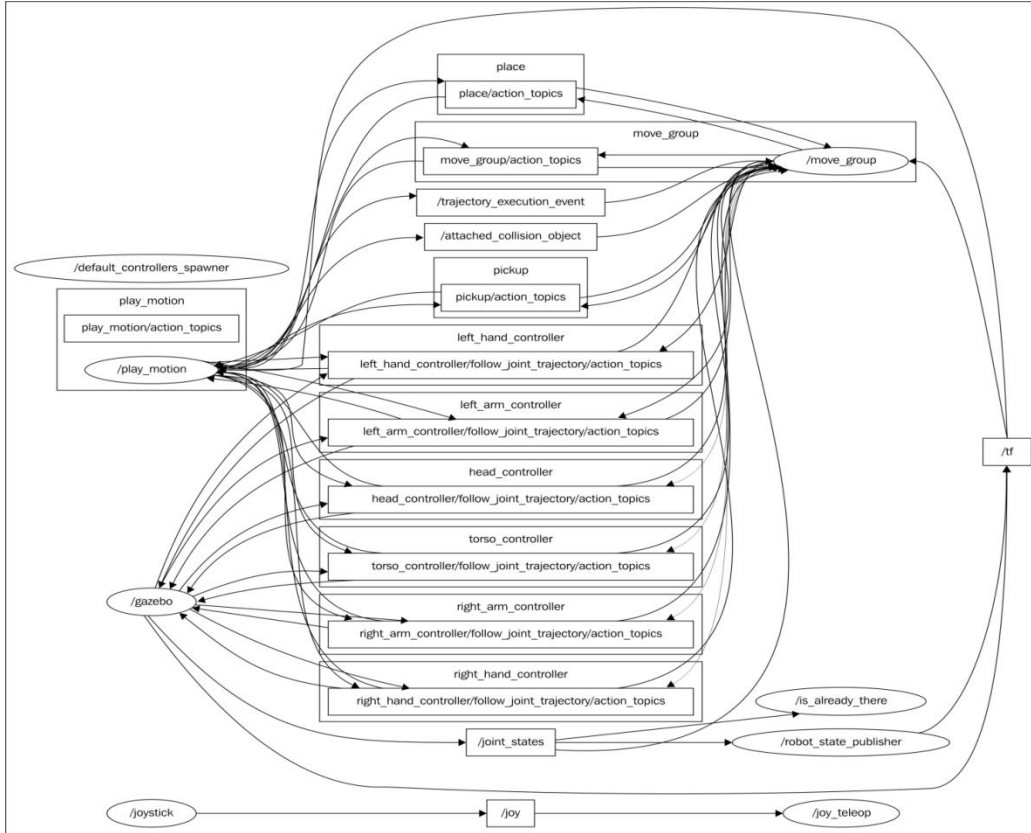
```
Services:  
* /teleop_turtle/get_loggers  
* /teleop_turtle/set_logger_level
```

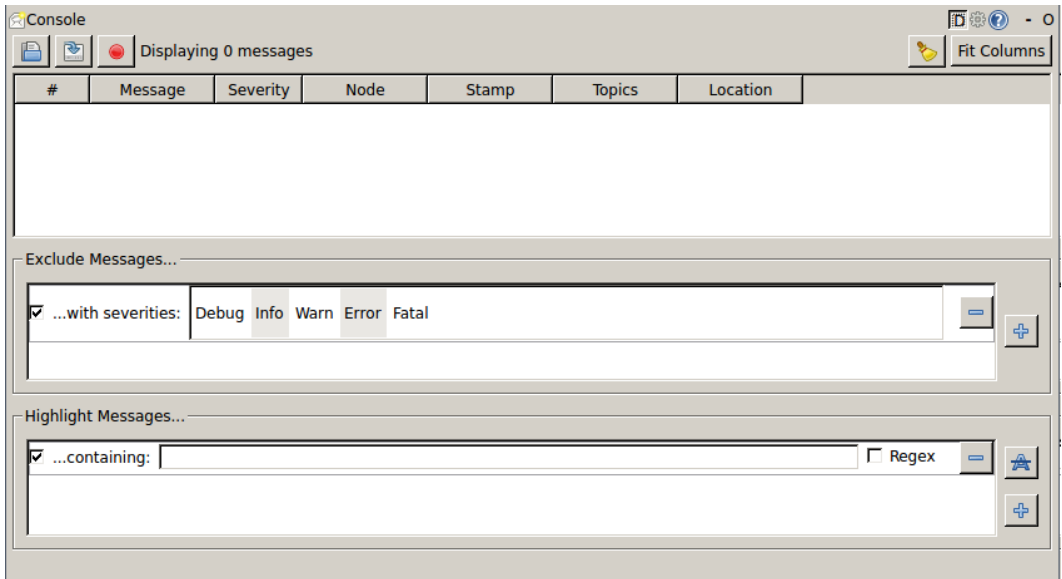
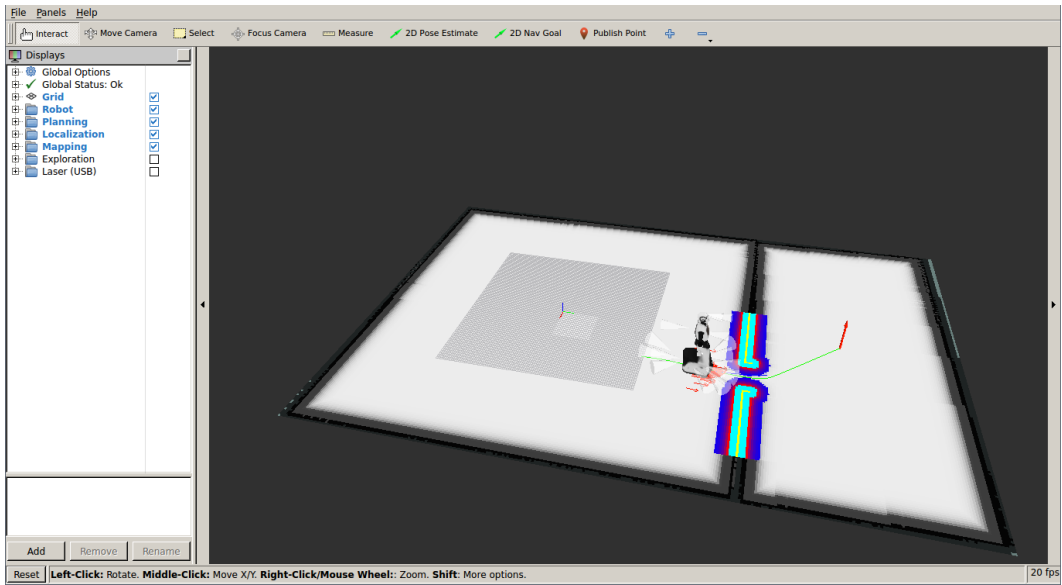
```
contacting node http://daneel:44645/ ...
```

```
Pid: 4156
```

```
Connections:  
* topic: /rosout  
  * to: /rosout  
  * direction: outbound  
  * transport: TCPROS  
* topic: /turtle1/cmd_vel  
  * to: /turtlesim  
  * direction: outbound  
  * transport: TCPROS
```

Chapter 3: Visualization and Debugging Tools





Console D ? - O

Displaying 49 messages Fit Columns

#	Message	Severity	Node	Stamp	Topics	Location
#49	INFO na...	Info	/example3	22:18:34.763...	/rosout	/home/enriqu...
#48	FATAL me...	Fatal	/example3	22:18:34.763...	/rosout	/home/enriqu...
#47	ERROR m...	Error	/example3	22:18:34.763...	/rosout	/home/enriqu...
#46	WARN m...	Warn	/example3	22:18:34.762...	/rosout	/home/enriqu...
#45	INFO mes...	Info	/example3	22:18:34.762...	/rosout	/home/enriqu...
#44	INFO thro...	Info	/example3	22:18:33.763...	/rosout	/home/enriqu...
#43	INFO na...	Info	/example3	22:18:33.763...	/rosout	/home/enriqu...
#42	FATAL me...	Fatal	/example3	22:18:33.763...	/rosout	/home/enriqu...
#41	ERROR m...	Error	/example3	22:18:33.763...	/rosout	/home/enriqu...
#40	WARN m...	Warn	/example3	22:18:33.762...	/rosout	/home/enriqu...
#39	INFO mes...	Info	/example3	22:18:33.762...	/rosout	/home/enriqu...
#38	INFO na...	Info	/example3	22:18:32.763...	/rosout	/home/enriqu...
#37	FATAL me...	Fatal	/example3	22:18:32.763...	/rosout	/home/enriqu...

Exclude Messages...

...with severities: Debug Info Warn Error Fatal - +

Highlight Messages...

...containing: Regex - +

Console Fit Columns

Displaying 22 messages

#	Message	Severity	Node	Stamp	Topics	Location
#22	INFO na...	Info	/example3	22:20:0		
#21	FATAL me...	Fatal	/example3	22:20:0		
#20	ERROR m...	Error	/example3	22:20:0		
#19	WARN m...	Warn	/example3	22:20:0		
#18	INFO mes...	Info	/example3	22:20:0		
#17	INFO thro...	Info	/example3	22:20:0		
#16	INFO na...	Info	/example3	22:20:0		
#15	FATAL me...	Fatal	/example3	22:20:0		
#14	ERROR m...	Error	/example3	22:20:0		
#13	WARN m...	Warn	/example3	22:20:0		
#12	INFO mes...	Info	/example3	22:20:0		
#11	INFO na...	Info	/example3	22:20:0		
#10	FATAL me...	Fatal	/example3	22:20:0		

Node: /example3
 Time: 22:20:02.943365568 (2014-06-29)
 Severity: Info
 Published Topics: /rosout
 INFO named message.
 Location:
 /home/enrique/svn/ros_book_hydro_ws/src/ros_book_v2/chapter3_tutorials/src/example3.cp
 p:main:21

Exclude Messages...

...with severities: Debug Info Warn Error Fatal

Highlight Messages...

...containing: Regex

Close

Console

Displaying 8 of 22 messages

#	Message	Severity	Node	Stamp	Topics	Location
#21	FATAL me...	Fatal	/example3	22:20:02.943...	/rosout	/home/enriqu...
#20	ERROR m...	Error	/example3	22:20:02.943...	/rosout	/home/enriqu...
#15	FATAL me...	Fatal	/example3	22:20:01.943...	/rosout	/home/enriqu...
#14	ERROR m...	Error	/example3	22:20:01.943...	/rosout	/home/enriqu...
#10	FATAL me...	Fatal	/example3	22:20:00.943...	/rosout	/home/enriqu...
#9	ERROR m...	Error	/example3	22:20:00.943...	/rosout	/home/enriqu...
#5	FATAL me...	Fatal	/example3	22:19:59.943...	/rosout	/home/enriqu...
#4	ERROR m...	Error	/example3	22:19:59.943...	/rosout	/home/enriqu...

Exclude Messages...

...with severities: **Debug** Info Warn Error Fatal

Highlight Messages...

...containing: Messages matching ANY of these rules will be highlighted Regex

Logger Level

Nodes	Loggers	Levels
/example3	ros	Debug
/rosout	ros.chapter3_tutorials	Info
/rqt_gui_py_node_4754	ros.chapter3_tutorials.named_msg	Warn
/rqt_gui_py_node_5180	ros.roscpp	Error
	ros.roscpp.roscpp_internal	Fatal
	ros.roscpp.superdebug	

Refresh

Logger Level

Nodes	Loggers	Levels
/example3	ros	Debug
/rosout	ros.chapter3_tutorials	Info
/rqt_gui_py_node_4754	ros.chapter3_tutorials.named_msg	Warn
/rqt_gui_py_node_5180	ros.roscpp	Error
	ros.roscpp.roscpp_internal	Fatal
	ros.roscpp.superdebug	

Refresh

Process Monitor

Filter: regex

Node	PID	CPU %	Mem %	Num Threads
/rqt_gui_py_node_10852	10852	13.10	1.07	5
/rosout	6271	1.00	0.12	5
/robot_state_publisher	6311	15.20	0.19	6
/play_motion	6398	20.20	0.54	9
/move_group	6365	25.30	0.72	19
/move_base	6575	26.30	0.43	11
/map_server	6408	9.10	0.14	5
/joystick	6319	9.10	0.11	5
/joy_teleop	6314	6.10	0.20	6
/is_already_there	6399	7.10	0.20	6
/gazebo	6296	139.00	3.78	69
/default_controllers_spawner	6299	6.10	0.20	5
/amcl	6438	19.20	0.26	7

Kill Node

Topic Monitor

Topic	Type	Bandwidth	Hz	Value
[-] /amcl_pose	geometry_msgs/PoseWithCovarianceStamped	unknown	unknown	
[-] header	std_msgs/Header			
[-] frame_id	string			'map'
[-] seq	uint32			0
[-] stamp	time			genpy.Time[5917000000]
[-] covariance	geometry_msgs/PoseWithCovariance			(0.20457495899314834, -0.001707561741432752, ...
[-] pose	geometry_msgs/Pose			
[-] orientation	geometry_msgs/Quaternion			
[-] w	float64			0.9999948663862841
[-] x	float64			0.0
[-] y	float64			0.0
[-] z	float64			0.003204247349652341
[-] position	geometry_msgs/Point			
[-] x	float64			0.005243756470619018
[-] y	float64			0.023378910660500424
[-] z	float64			0.0
[-] /amcl/parameter_descriptions	dynamic_reconfigure/ConfigDescription			not monitored
[-] /amcl/parameter_updates	dynamic_reconfigure/Config			not monitored
[-] /attached_collision_object	moveit_msgs/AttachedCollisionObject			not monitored
[-] /back_camera/camera_info	sensor_msgs/CameraInfo			not monitored
[x] /back_camera/image	sensor_msgs/Image	10.22MB/s	9.34	
[-] /back_camera/image/compressed	sensor_msgs/CompressedImage			not monitored
[-] /back_camera/image/compressed/parameter_descriptions	dynamic_reconfigure/ConfigDescription			not monitored
[-] /back_camera/image/compressed/parameter_updates	dynamic_reconfigure/Config			not monitored
[-] /back_camera/image/compressedDepth	sensor_msgs/CompressedImage			not monitored
[-] /back_camera/image/compressedDepth/parameter_descriptions	dynamic_reconfigure/ConfigDescription			not monitored
[-] /back_camera/image/compressedDepth/parameter_updates	dynamic_reconfigure/Config			not monitored
[-] /back_camera/parameter_descriptions	dynamic_reconfigure/ConfigDescription			not monitored
[-] /back_camera/parameter_updates	dynamic_reconfigure/Config			not monitored
[x] /base_inclinometer	sensor_msgs/Imu	16.80KB/s	50.00	
[-] angular_velocity	geometry_msgs/Vector3			
[-] angular_velocity_covariance	float64[9]			(-1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0)
[-] header	std_msgs/Header			
[-] linear_acceleration	geometry_msgs/Vector3			
[-] x	float64			0.0
[-] y	float64			0.0
[-] z	float64			0.0
[-] linear_acceleration_covariance	float64[9]			(-1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0)
[-] orientation	geometry_msgs/Quaternion			
[-] orientation_covariance	float64[9]			(0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0)
[-] /bumper_states	gazebo_msgs/ContactsState			can not get message class for type "gazebo_msgs/C...
[-] /clock	roscpp_msgs/Clock			not monitored
[-] /diagnostics	diagnostic_msgs/DiagnosticArray			not monitored

Message Publisher

Topic: /distance Type: std_msgs/Int32 Freq: 20 Hz

topic	type	rate	expression
<input checked="" type="checkbox"/> /bumper	std_msgs/Bool	1.00	
data	bool		False
<input checked="" type="checkbox"/> /distance	std_msgs/Int32	2.00	
data	int32		2*i

```

~$ rostopic echo /bumper
data: False
...
data: False
...
data: False
...
data: False
...
data: False
...
[]

~$ rostopic echo /distance
data: 3286
...
data: 3288
...
data: 3290
...
data: 3292
...
data: 3294
...
data: 3296
...
data: 3298
...

```

Service Caller

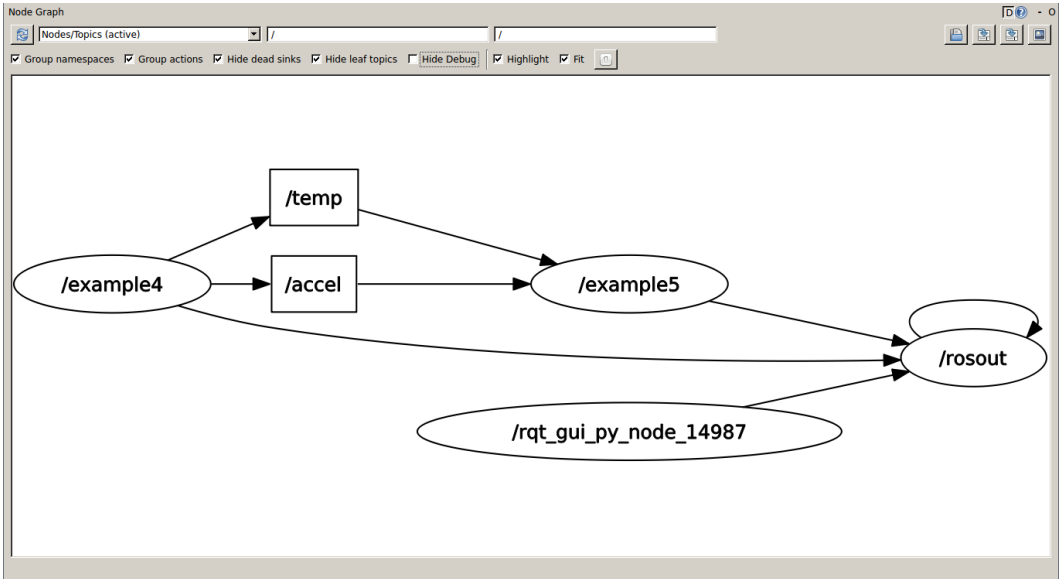
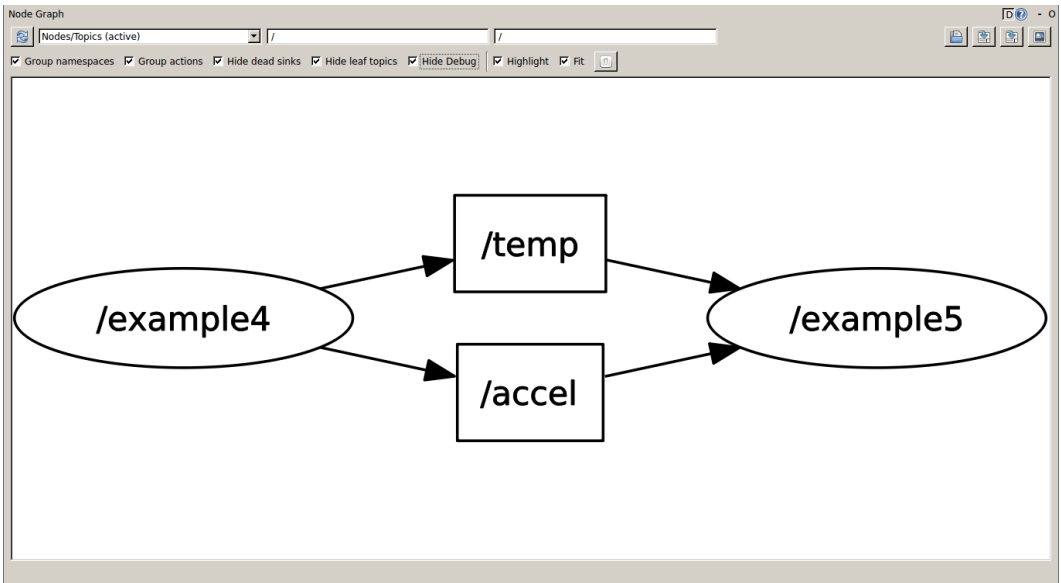
Service: /move_base/NavfnROS/make_plan Call

Request

Topic	Type	Expression
/move_base/NavfnROS/make_plan	nav_msgs/GetPlanRequest	
start	geometry_msgs/PoseStamped	
header	std_msgs/Header	
seq	uint32	0
stamp	time	genpy.Time[0]
frame_id	string	"
pose	geometry_msgs/Pose	
position	geometry_msgs/Point	
x	float64	0.0
y	float64	0.0
z	float64	0.0
orientation	geometry_msgs/Quaternion	
x	float64	0.0
y	float64	0.0
z	float64	0.0
w	float64	0.0
goal	geometry_msgs/PoseStamped	
header	std_msgs/Header	
seq	uint32	0

Response

Field	Type	Value
/	nav_msgs/GetPlanResponse	
plan	nav_msgs/Path	
header	std_msgs/Header	
seq	uint32	0
stamp	time	genpy.Time[613797000000]
frame_id	string	'map'
poses	geometry_msgs/PoseStamped[]	[]



```
string = Foo
[ INFO] [1404155692.740704020]: New configuration received with level = 3:
bool   = 0
int    = 2
double = 1.00531
string = Foo
[ INFO] [1404155699.438546902]: New configuration received with level = 0:
bool   = 0
int    = 2
double = 1.00531
string = Bar
[ INFO] [1404155713.895218175]: New configuration received with level = 0:
bool   = 0
int    = 2
double = 1.00531
string = Baz
[]
```

Dynamic Reconfigure

Filter key:

- example6

/example6

bool_param

int_param -10 10

double_param -3.14159265359 3.14159265359

string_param

(System message might be shown here when necessary)

File

guid:	<input type="text" value="08144361026320a0"/>
video_mode:	<input type="text" value="Format0_Mode5 ('640x480_mono8')"/> ▾
frame_id:	<input type="text" value="/camera"/>
frame_rate:	<input type="text" value="1.875"/> <input type="range" value="240"/> <input type="text" value="30"/>
iso_speed:	<input type="text" value="100"/> <input type="range" value="3200"/> <input type="text" value="400"/>
camera_info_url:	<input type="text"/>
bayer_pattern:	<input type="text" value="none ('')"/> ▾
bayer_method:	<input type="text" value="image_proc ('')"/> ▾
auto_brightness:	<input type="text" value="Auto (2)"/> ▾
brightness:	<input type="text" value="0"/> <input type="range" value="4095"/> <input type="text" value="383"/>
auto_exposure:	<input type="text" value="Auto (2)"/> ▾
exposure:	<input type="text" value="-10"/> <input type="range" value="4095"/> <input type="text" value="511"/>
auto_gain:	<input type="text" value="Manual (3)"/> ▾
gain:	<input type="text" value="-10"/> <input type="range" value="4095"/> <input type="text" value="255"/>
auto_gamma:	<input type="text" value="Manual (3)"/> ▾
gamma:	<input type="text" value="0"/> <input type="range" value="10"/> <input type="text" value="1"/>
auto_hue:	<input type="text" value="None (5)"/> ▾
hue:	<input type="text" value="0"/> <input type="range" value="4095"/> <input type="text" value="0"/>
auto_iris:	<input type="text" value="None (5)"/> ▾
iris:	<input type="text" value="0"/> <input type="range" value="4095"/> <input type="text" value="8"/>
auto_saturation:	<input type="text" value="Manual (3)"/> ▾
saturation:	<input type="text" value="0"/> <input type="range" value="4095"/> <input type="text" value="90"/>
auto_sharpness:	<input type="text" value="Manual (3)"/> ▾
sharpness:	<input type="text" value="0"/> <input type="range" value="4095"/> <input type="text" value="80"/>
auto_shutter:	<input type="text" value="Manual (3)"/> ▾
shutter:	<input type="text" value="0"/> <input type="range" value="4095"/> <input type="text" value="4"/>
auto_white_balance:	<input type="text" value="Auto (2)"/> ▾
white_balance_BU:	<input type="text" value="0"/> <input type="range" value="4095"/> <input type="text" value="82"/>
white_balance_RV:	<input type="text" value="0"/> <input type="range" value="4095"/> <input type="text" value="82"/>

```

$ roswtf
No package or stack in context
=====
Static checks summary:
Found 1 warning(s).
Warnings are things that may be just fine, but are sometimes at fault
WARNING You have pip installed packages on Ubuntu, remove and install using Debian packages: rospkg --
=====
Beginning tests of your ROS graph. These may take awhile...
analyzing graph...
... done analyzing graph
running graph rules...
... done running graph rules
Online checks summary:
No errors or warnings
=====
WARNING: Package name "3dof_bringup" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits and underscores.
WARNING: Package name "3dof_robot" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits and underscores.
WARNING: Package name "3dof_description" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits and underscores.
WARNING: Package name "3dof_controller_configuration" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits and underscores.
process[rosout-1]: started with pid [12411]
started core service [/rosout]
process[example6-2]: started with pid [12423]
[ INFO ] [1404156269.276210812]: New configuration received with level = 4294967295:
bool = 1
int = 0
double = 0
string = Foo
]

```

```

$ catkin_lint -W2 --pkg chapter3_tutorials
chapter3_tutorials: notice: target name 'example6' might not be sufficiently unique
chapter3_tutorials: notice: target name 'example7' might not be sufficiently unique
chapter3_tutorials: notice: target name 'example4' might not be sufficiently unique
chapter3_tutorials: notice: target name 'example5' might not be sufficiently unique
chapter3_tutorials: notice: target name 'example2' might not be sufficiently unique
chapter3_tutorials: notice: target name 'example3' might not be sufficiently unique
chapter3_tutorials: notice: target name 'example1' might not be sufficiently unique
chapter3_tutorials: notice: target name 'example8' might not be sufficiently unique
chapter3_tutorials: CMakeLists.txt(83): notice: extra arguments in endforeach()
catkin_lint: checked 1 packages and found 9 problems
=====
WARNING: Package name "3dof_bringup" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits and underscores.
WARNING: Package name "3dof_robot" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits and underscores.
WARNING: Package name "3dof_description" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits and underscores.
WARNING: Package name "3dof_controller_configuration" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits and underscores.
process[rosout-1]: started with pid [12411]
started core service [/rosout]
process[example6-2]: started with pid [12423]
[ INFO ] [1404156269.276210812]: New configuration received with level = 4294967295:
bool = 1
int = 0
double = 0
string = Foo

```

Runtime Monitor

- Stale (0)
- Errors (0)
- Warnings (0)
- Ok (1)
 - example7: status: ok

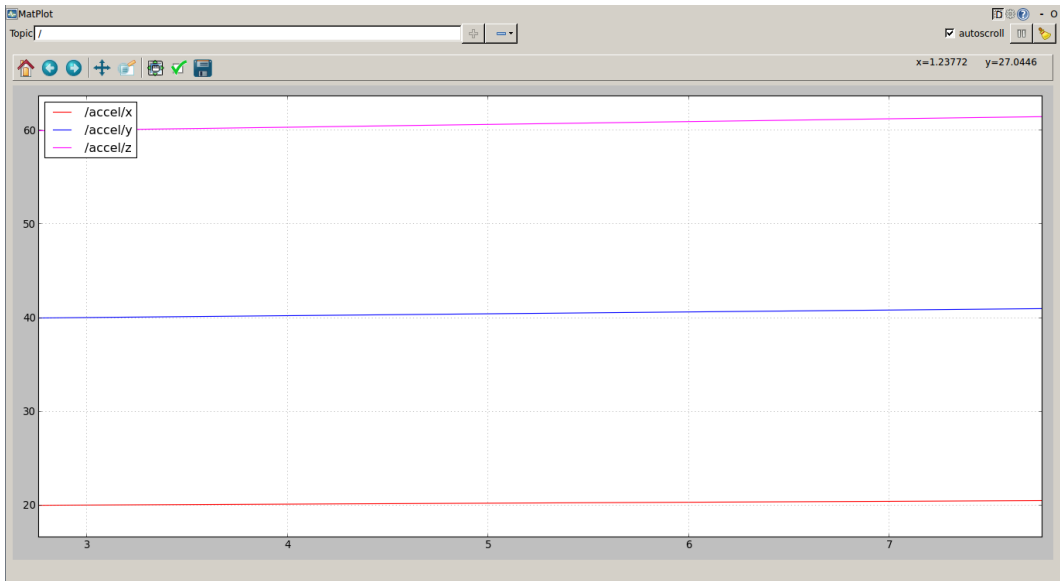
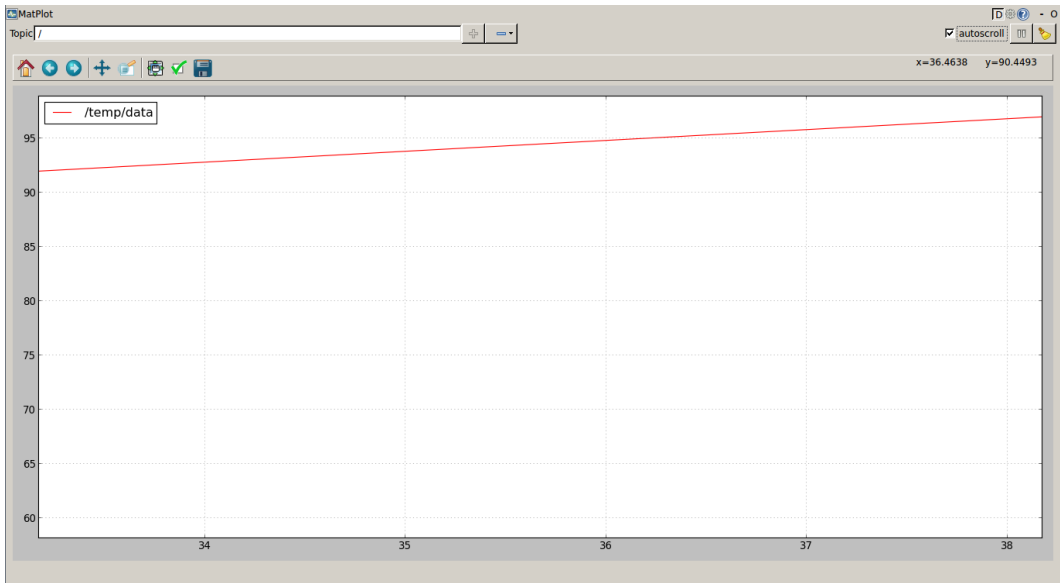
Robot Monitor

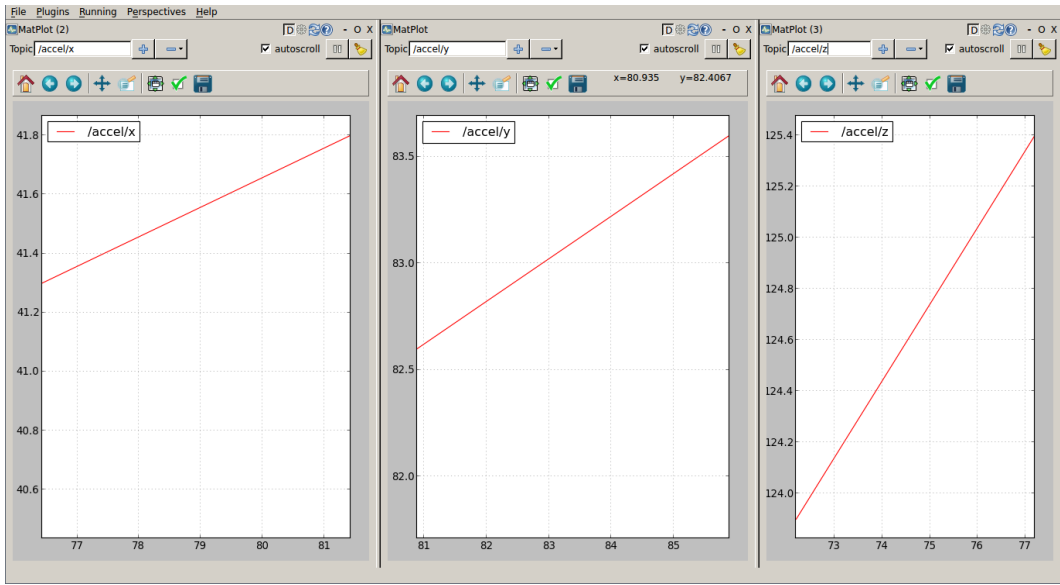
Error Device	Message
/Sensors/Status/example7: status error	

Warned Device	Message

All devices	Message
(Err: 2, Wm: 0) Sensors Error	Error
Status	Error
example7: status	error

<- old Last message received 0 seconds ago new -> Pause





Plot Type

PyQtGraph

Based on PyQtGraph

- installer: <http://luke.campagnola.me/code/pyqtgraph>

MatPlot

Based on Matplotlib

- needs most CPU

- needs matplotlib \geq 1.1.0

- if using PySide: PySide $>$ 1.1.0

QwtPlot

Based on QwtPlot

- does not use timestamps

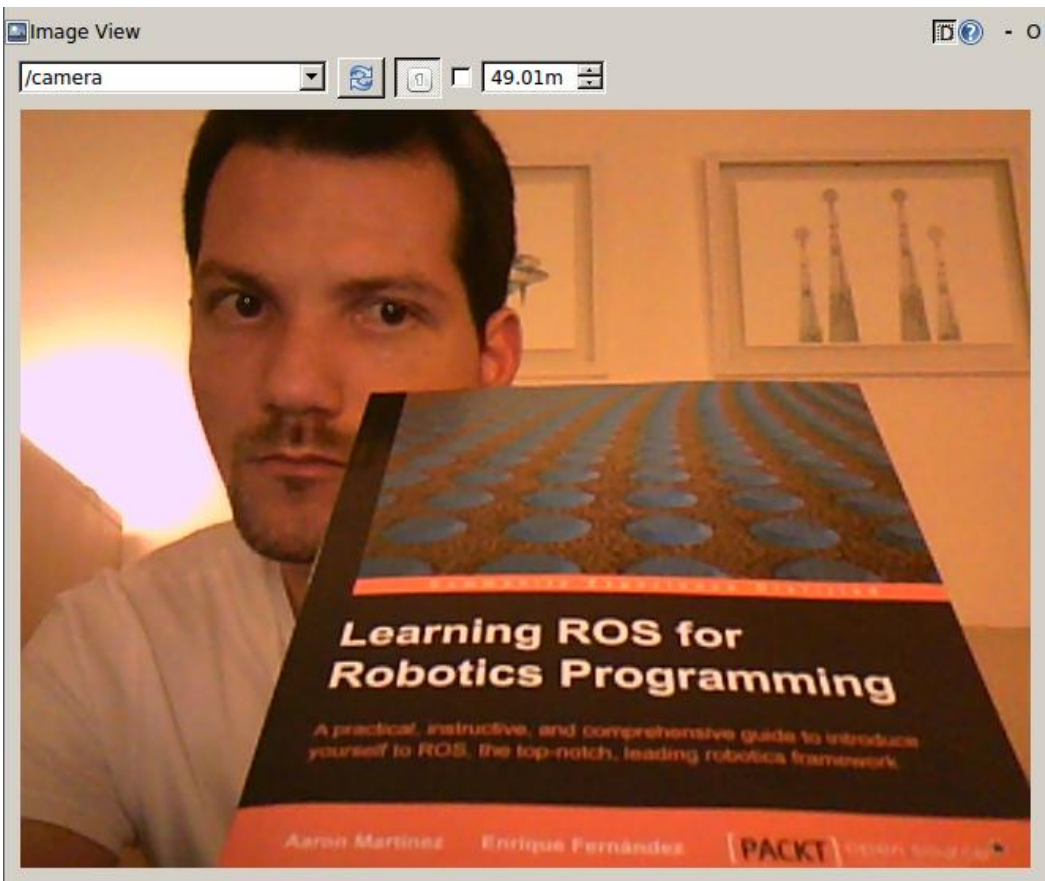
- uses least CPU

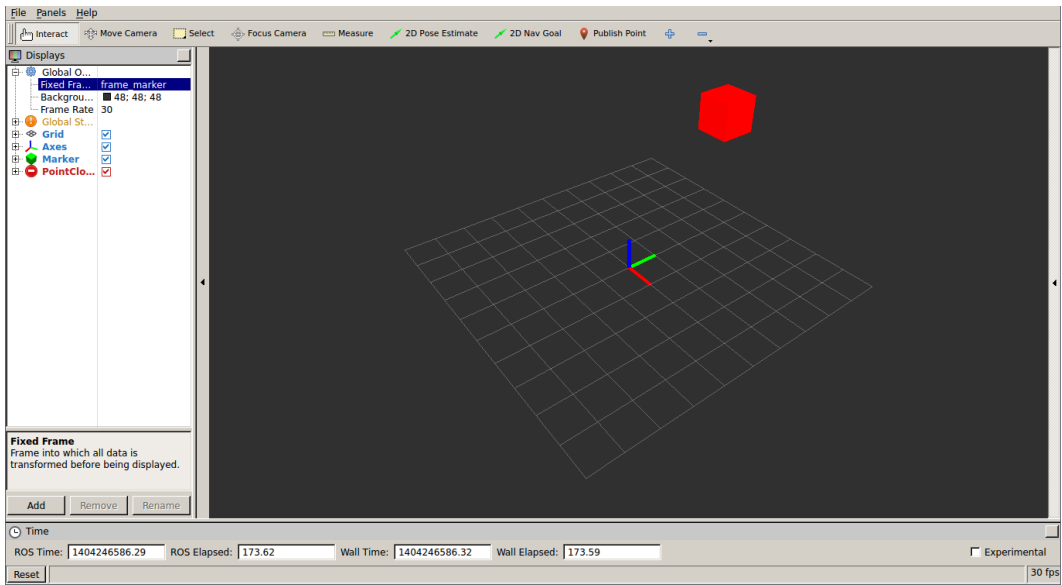
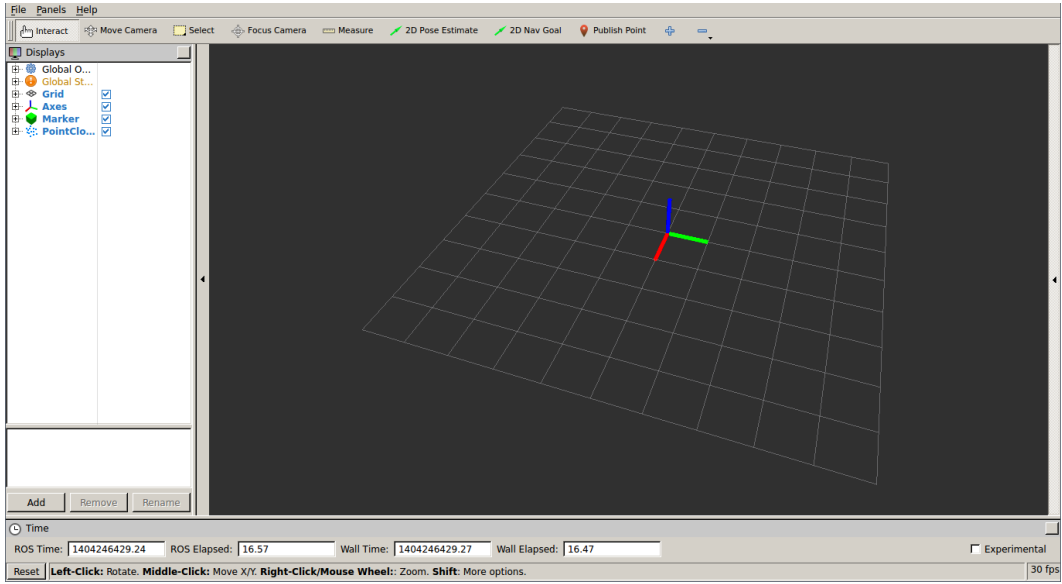
- needs Python Qwt bindings

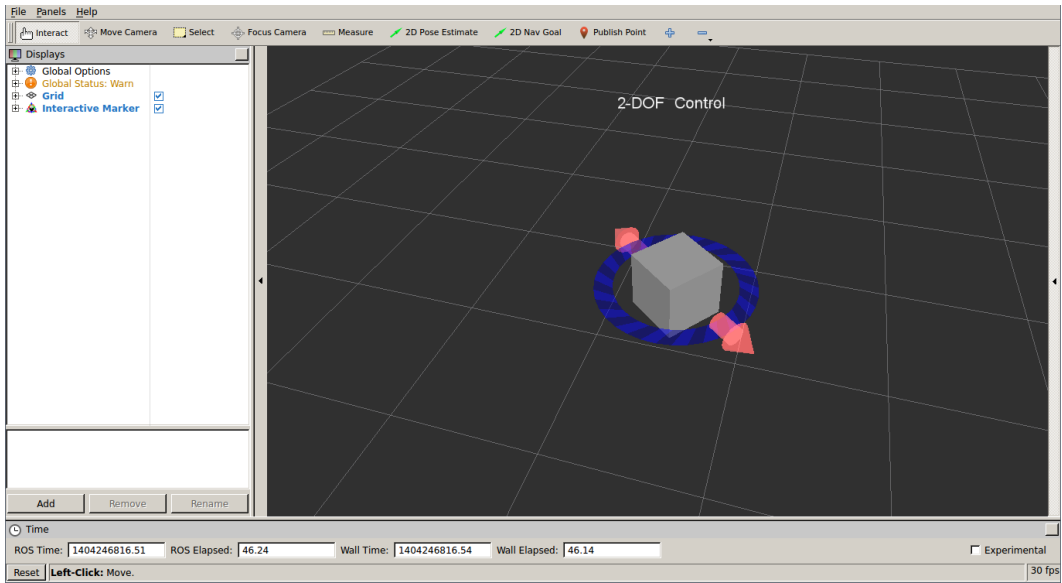
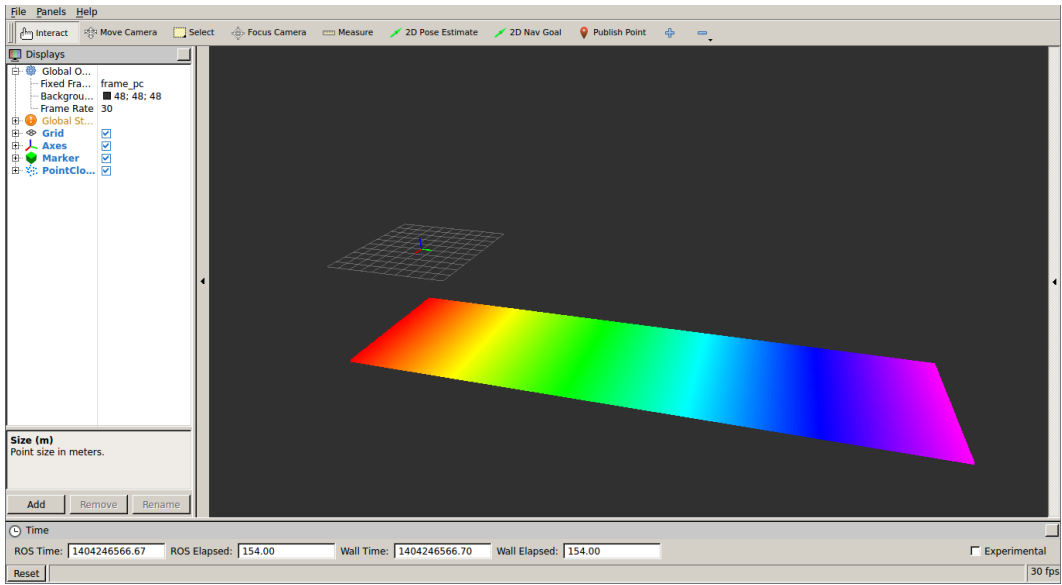
OK

Cancel

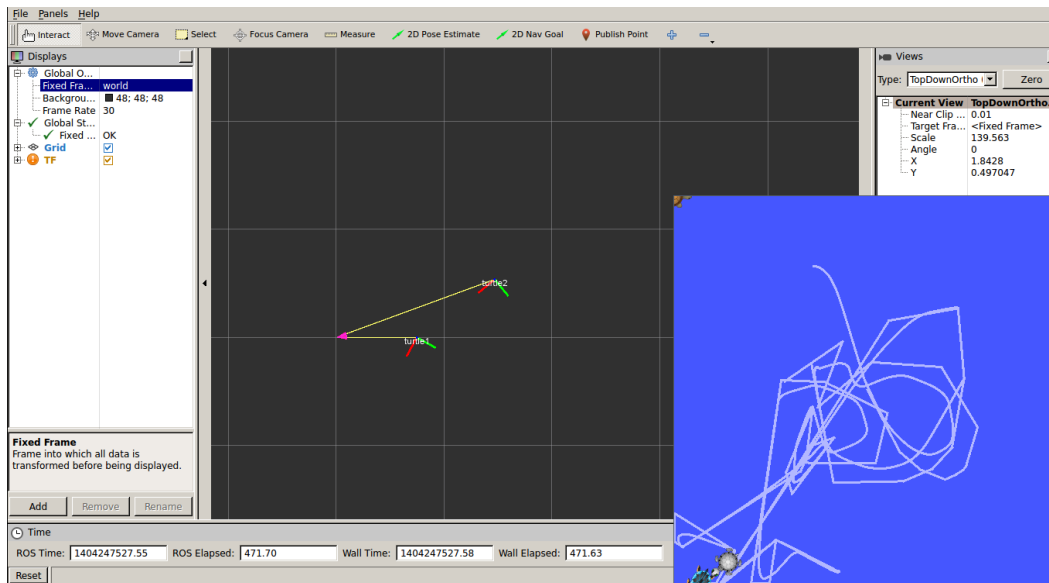
```
~$ rostopic hz /camera
subscribed to [/camera]
average rate: 10.728
  min: 0.084s max: 0.099s std dev: 0.00474s window: 10
average rate: 10.746
  min: 0.084s max: 0.099s std dev: 0.00441s window: 21
average rate: 10.725
  min: 0.084s max: 0.099s std dev: 0.00426s window: 31
average rate: 10.710
  min: 0.084s max: 0.100s std dev: 0.00409s window: 42
average rate: 10.702
  min: 0.084s max: 0.100s std dev: 0.00398s window: 53
```







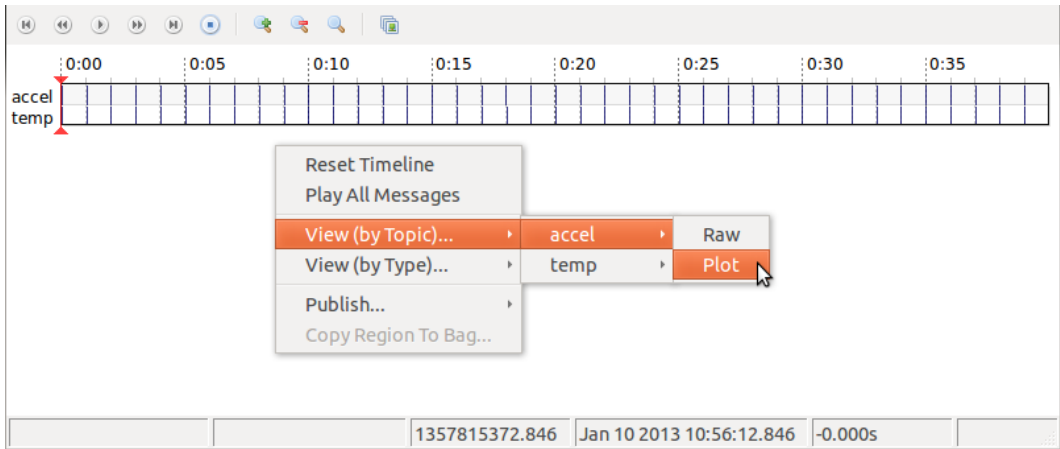
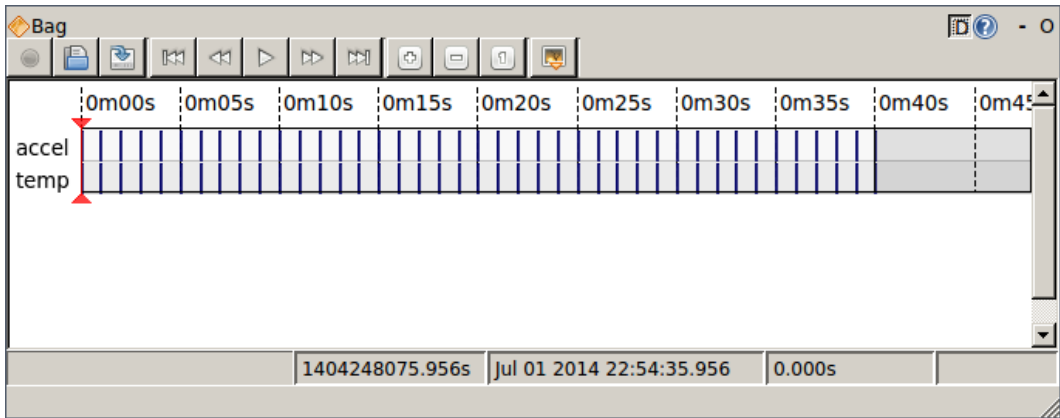


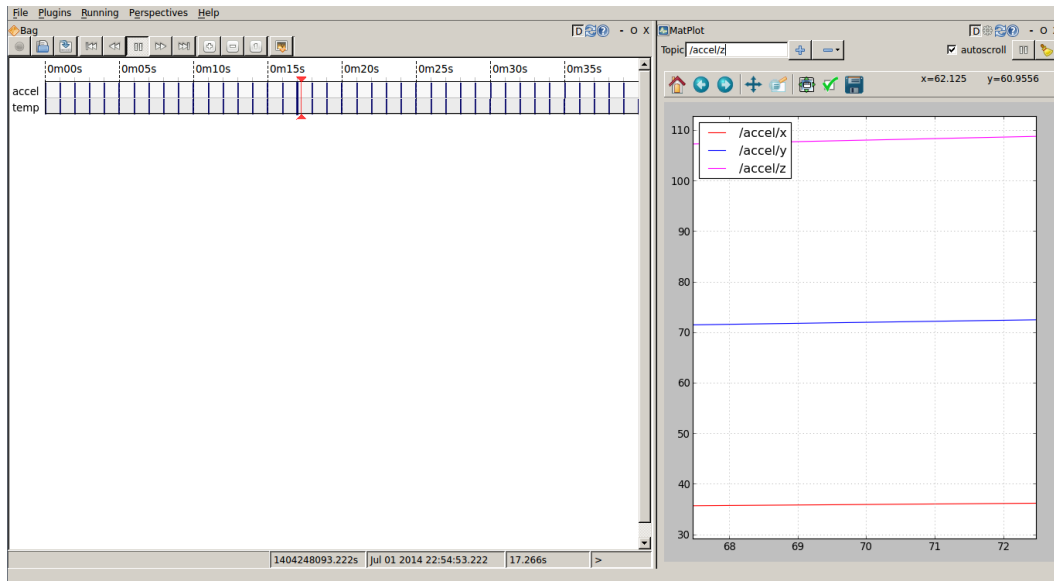


```

~$ rosbag info 2014-07-01-22-54-34.bag
path:          2014-07-01-22-54-34.bag
version:       2.0
duration:      40.0s
start:         Jul 01 2014 22:54:35.96 (1404248075.96)
end:          Jul 01 2014 22:55:15.96 (1404248115.96)
size:         10.9 KB
messages:     82
compression:  none [1/1 chunks]
types:        geometry_msgs/Vector3 [4a842b65f413084dc2b10fb484ea7f17]
              std_msgs/Int32        [da5909fbe378aeaf85e547e830cc1bb7]
topics:       /accel  41 msgs      : geometry_msgs/Vector3
              /temp   41 msgs      : std_msgs/Int32

```



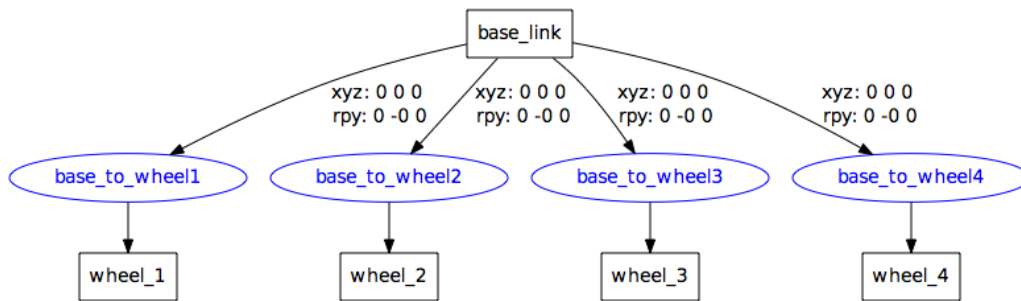


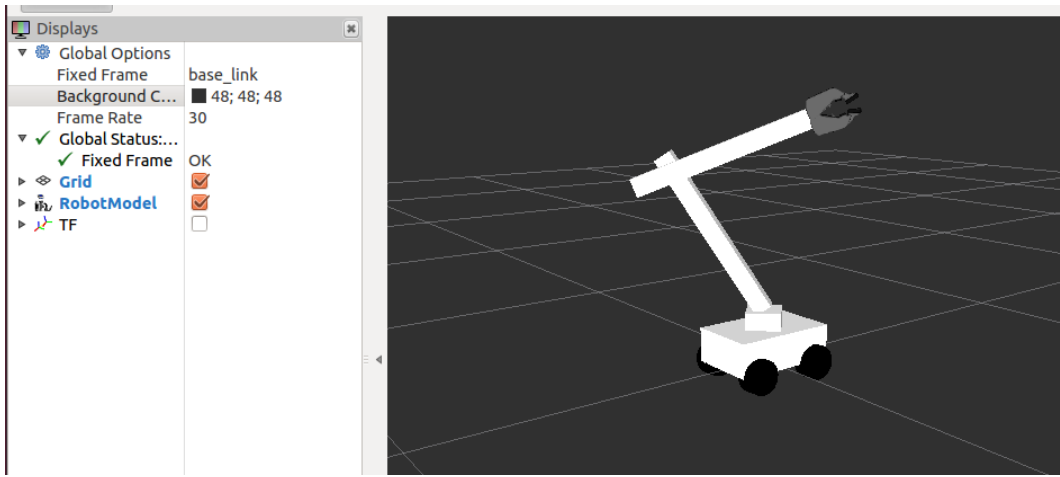
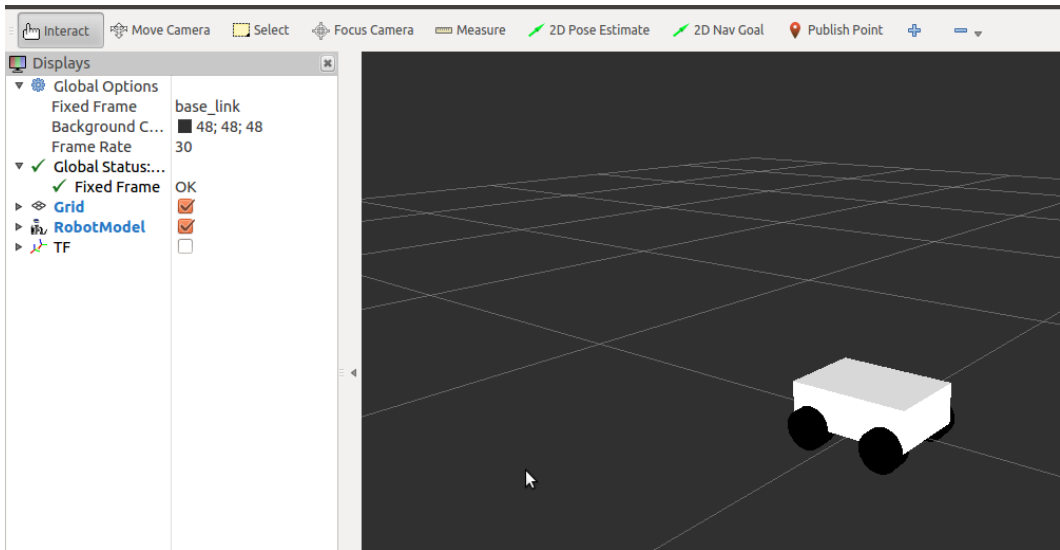
```
(gdb) r
Starting program: /home/luis/devel/catkin_ws/devel/lib/chapter3_tutorials/exampl
e1
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
[New Thread 0x7ffff170d700 (LWP 6618)]
[New Thread 0x7ffff0f0c700 (LWP 6619)]
[New Thread 0x7ffffbfff700 (LWP 6620)]
[New Thread 0x7ffffb7fe700 (LWP 6625)]
[DEBUG] [1476313631.940149636]: This is a simple DEBUG message!
[DEBUG] [1476313631.940214159]: This is a DEBUG message with an argument: 3.1400
00
[DEBUG] [1476313631.940246937]: This is DEBUG stream message with an argument: 3
.14
[Thread 0x7ffffb7fe700 (LWP 6625) exited]
[Thread 0x7ffff170d700 (LWP 6618) exited]
[Thread 0x7ffff0f0c700 (LWP 6619) exited]
[Thread 0x7ffffbfff700 (LWP 6620) exited]
[Inferior 1 (process 6613) exited normally]
(gdb) █
```

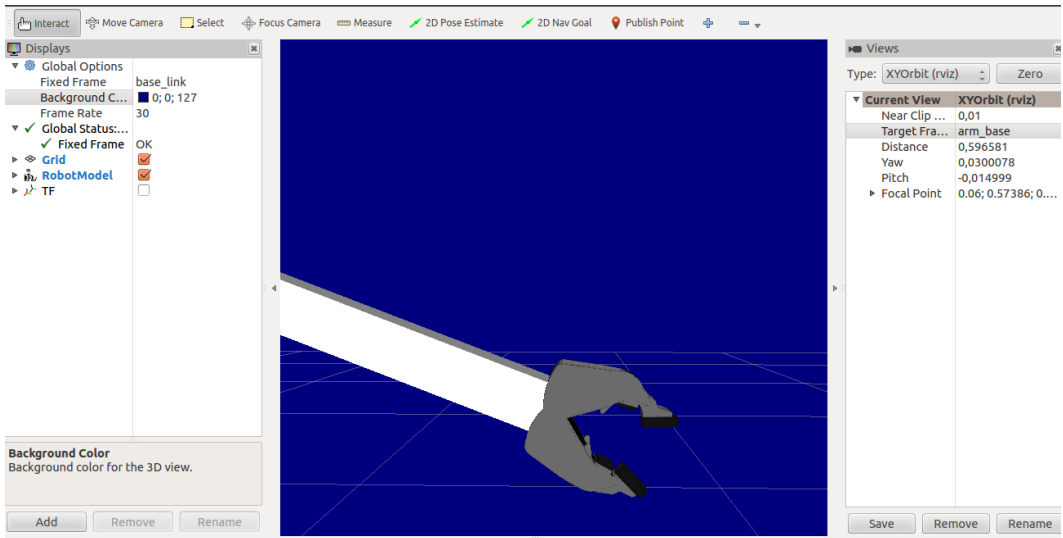

Chapter 4: 3D Modeling and Simulation

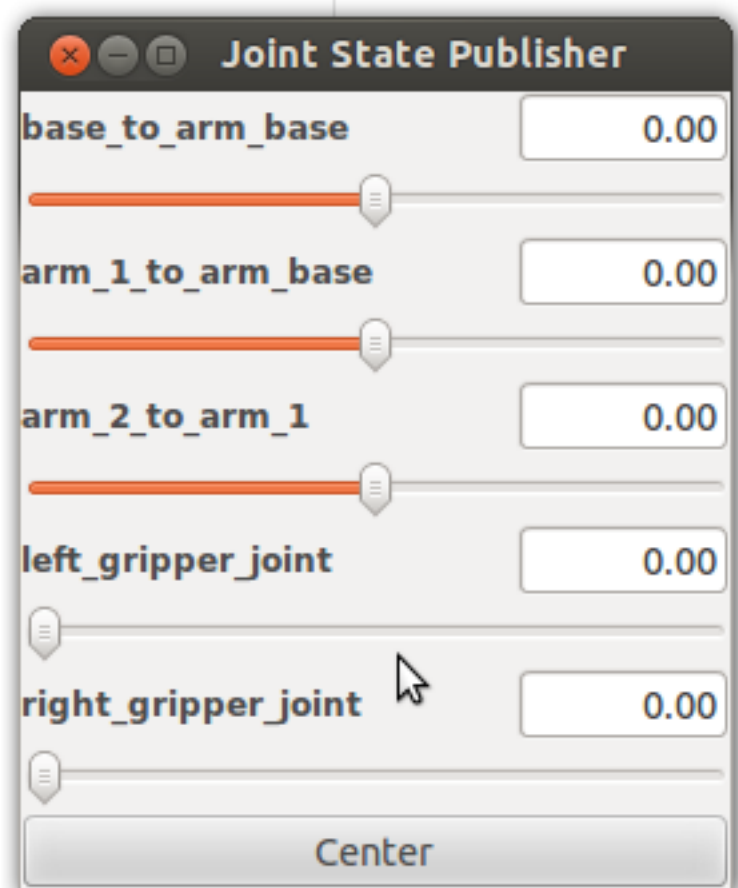
```
robot name is: Robot1
----- Successfully Parsed XML -----

root Link: base_link has 4 child(ren)
child(1): wheel_1
child(2): wheel_2
child(3): wheel_3
child(4): wheel_4
|
```









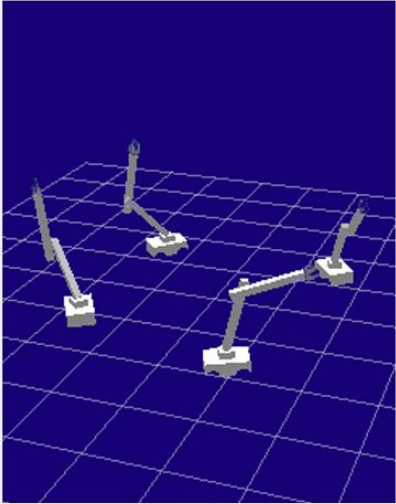
File Panels Help

Move Camera Interact Select 2D Nav Goal 2D Pose Estimate

Displays

- Global Options
 - Background... 23, 0, 119
 - Fixed Frame /odom
 - Target Fra... <Fixed Frame>
- Global Status: OK
- 01. Grid (Grid)**
 - Status: OK
 - Reference ... <Fixed Frame>
 - Plane Cell ... 10
 - Normal Ce... 0
 - Cell Size 0.5
 - Line Style Lines
 - Color 228, 228, 228
 - Alpha 0.5
 - Plane XY

Add Remove Rename



Tool Properties

- 2D Nav Goal
 - Topic goal
- 2D Pose Estimate
 - Topic initialpose

Views

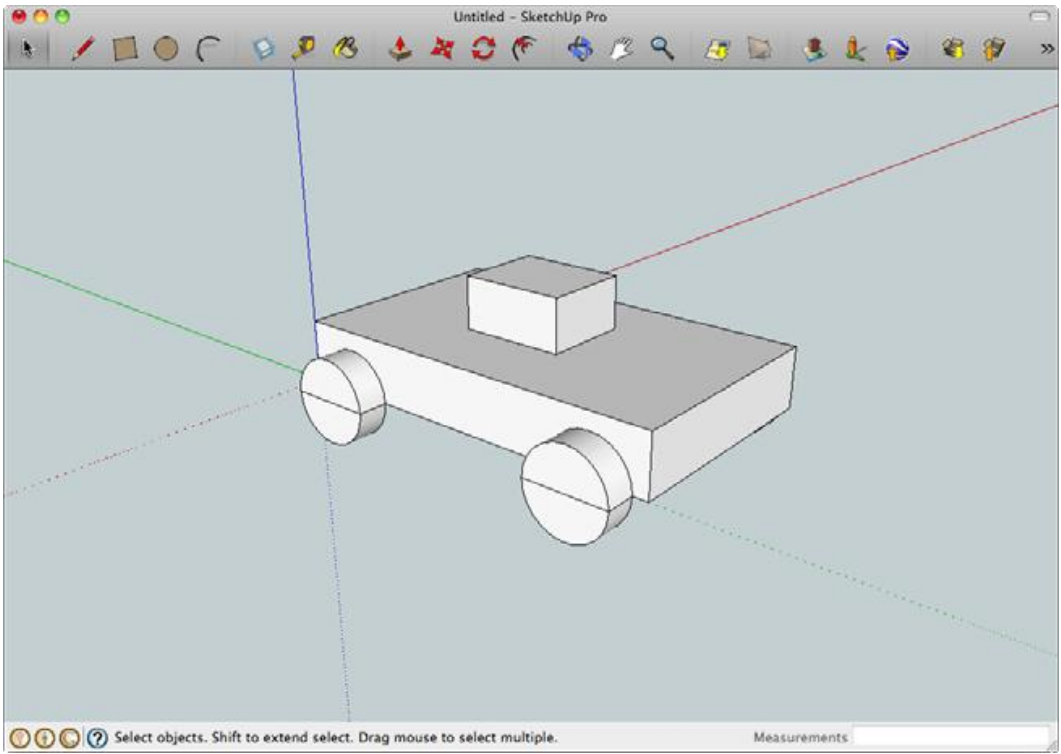
Type: Orbit Zero

Save Current Load Delete

Selection

Time

Wall Time: 1363109660.65 Wall Elapsed: 58.34 ROS Time: 1363109660.65 ROS Elapsed: 58.34 Reset



File Panels Help

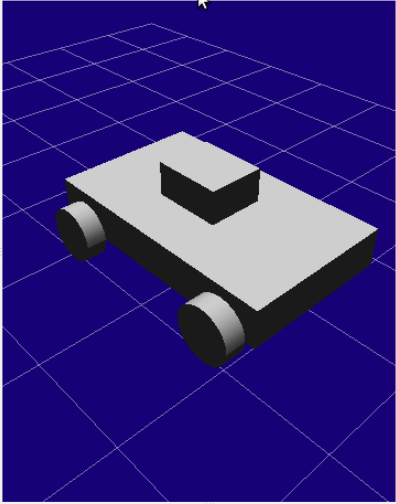
Move Camera Interact Select 2D Nav Goal 2D Pose Estimate

Displays

- Cell Size 0.5
- Line Style Lines
- Color 228, 228, 228
- Alpha 0.5
- Plane XY
- Offset 0; 0; 0
- 02. Robot Mo...
- Status: OK
- Visual Ena...
- Collision E...
- Update Int... 0
- Alpha 1
- Robot Des... robot_descrip...
- TF Prefix
- Links

Status: OK

Add Remove Rename



Tool Properties

- 2D Nav Goal
 - Topic goal
- 2D Pose Estimate
 - Topic initialpose

Views

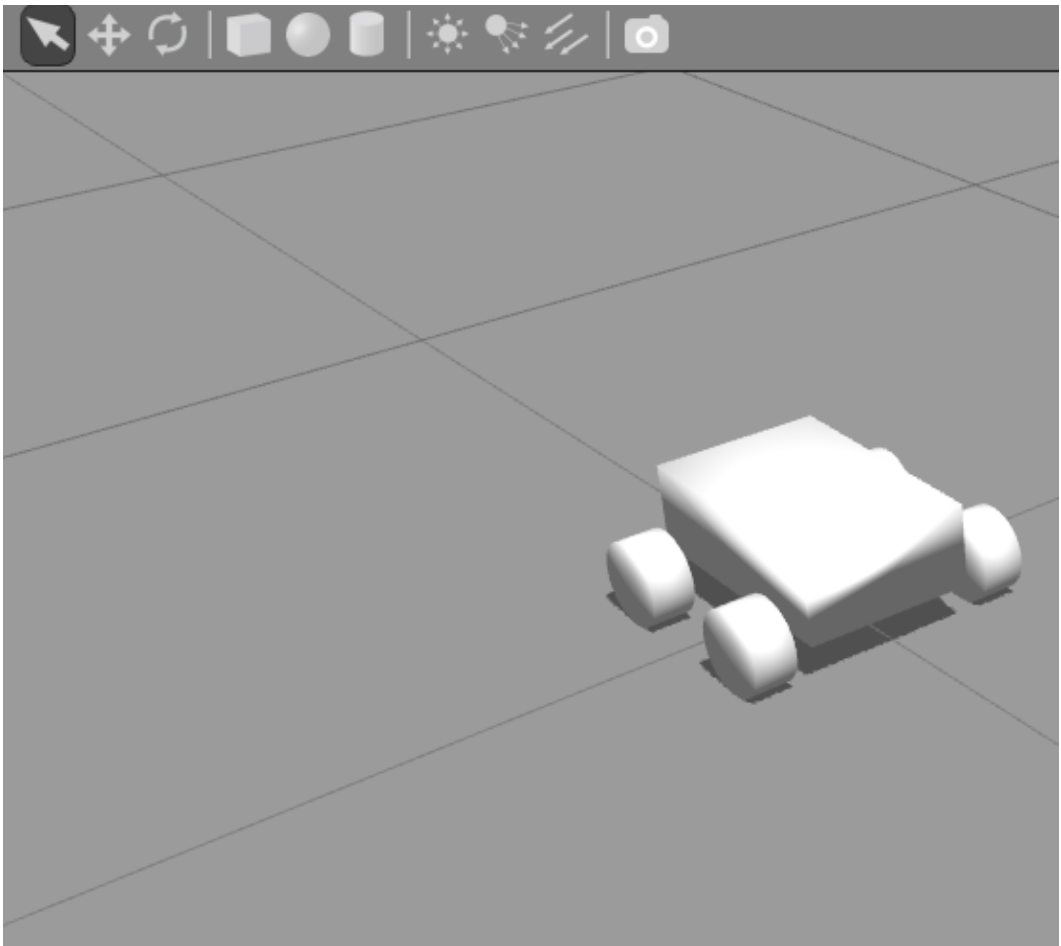
Type: Orbit Zero

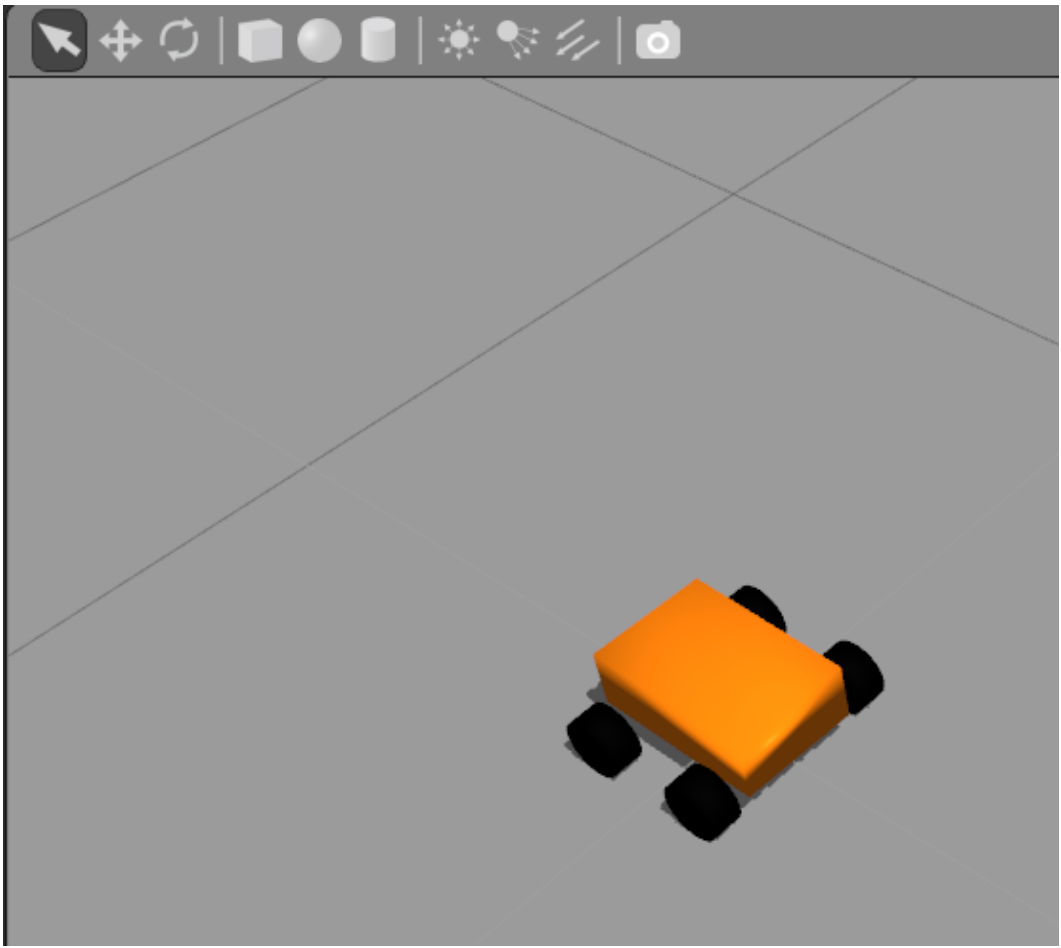
Save Current Load Delete

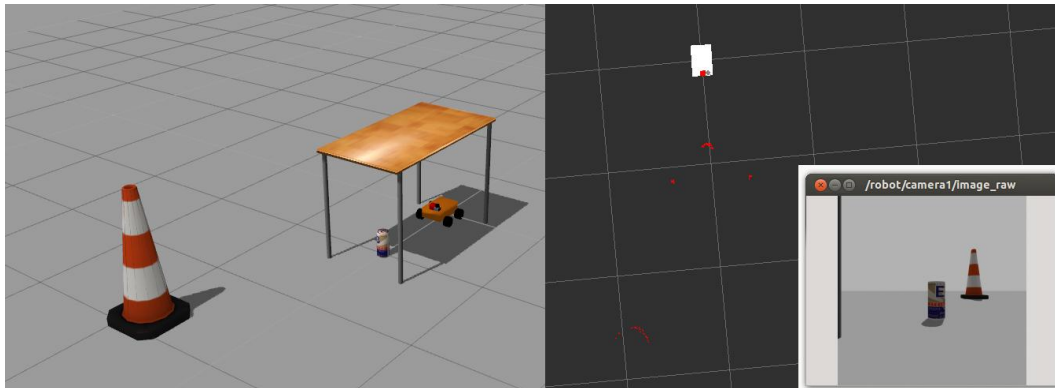
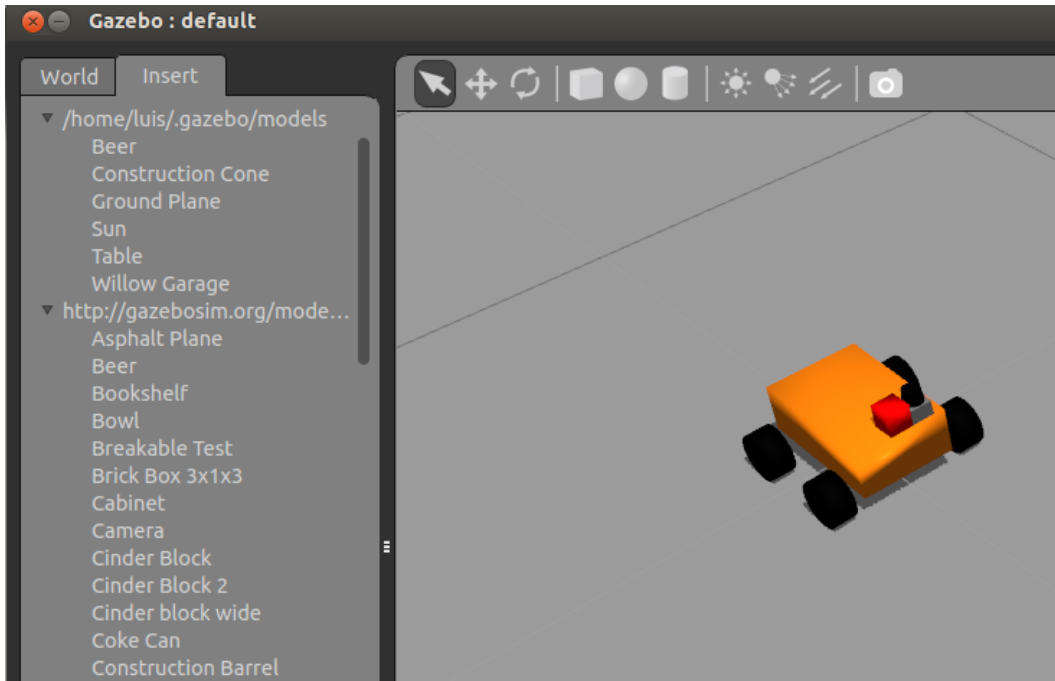
Selection

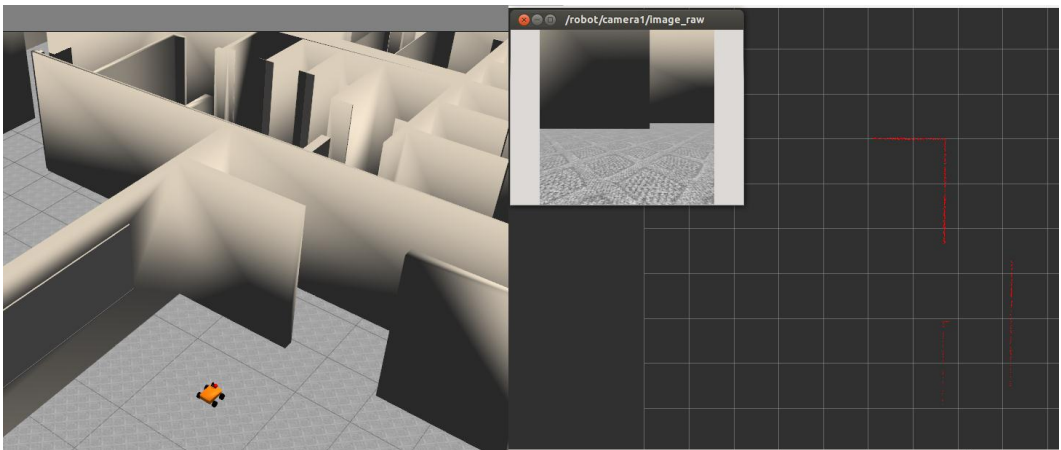
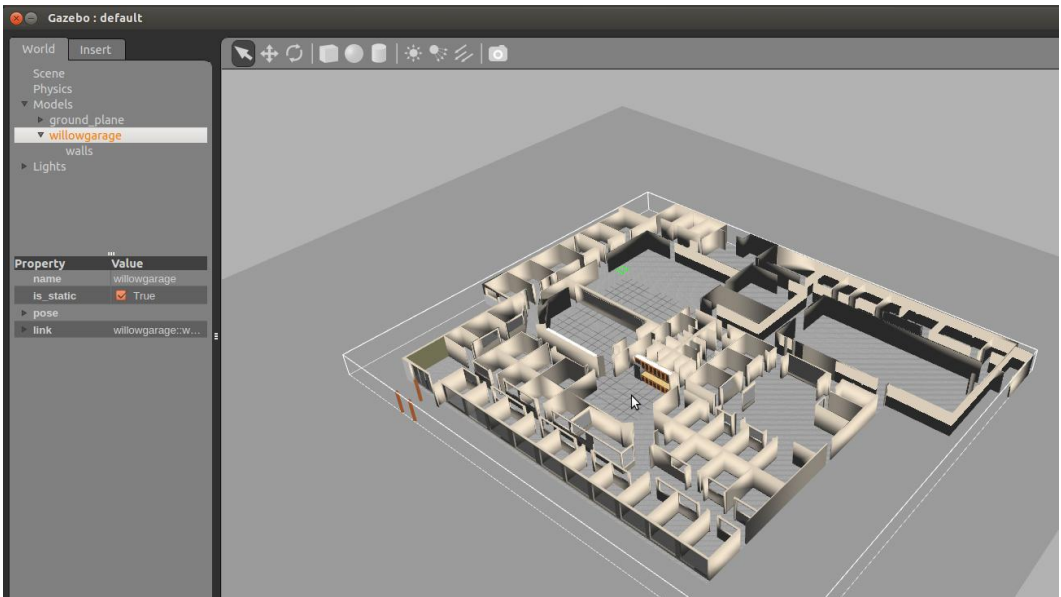
Time

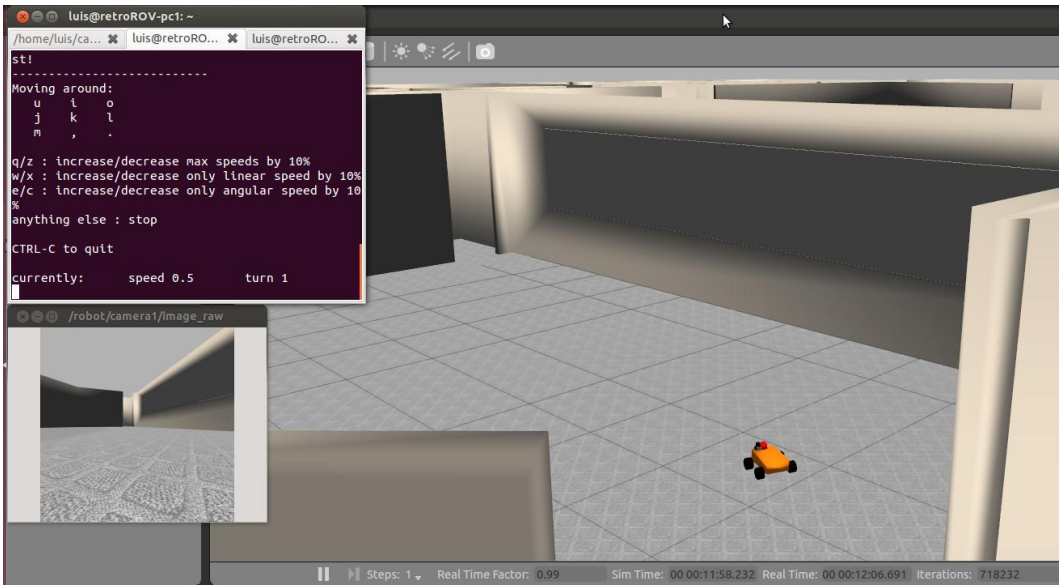
Wall Time: 1363113603.66 Wall Elapsed: 61.03 ROS Time: 1363113603.66 ROS Elapsed: 61.03 Reset



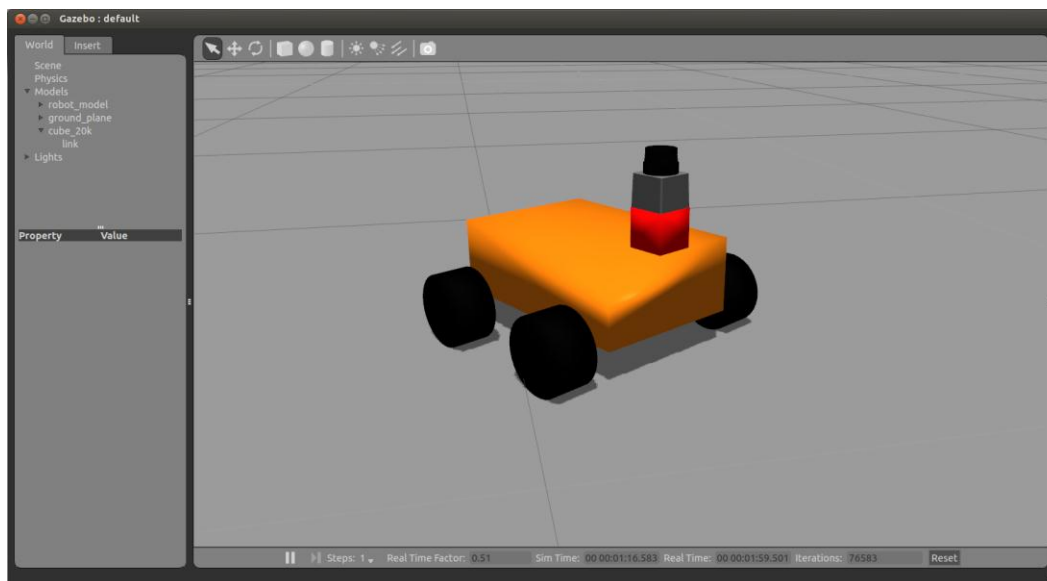
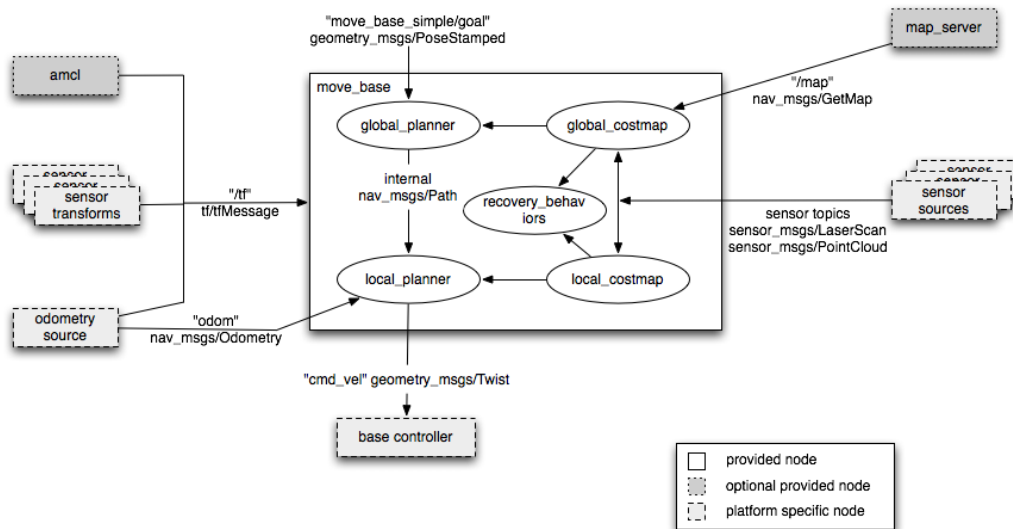


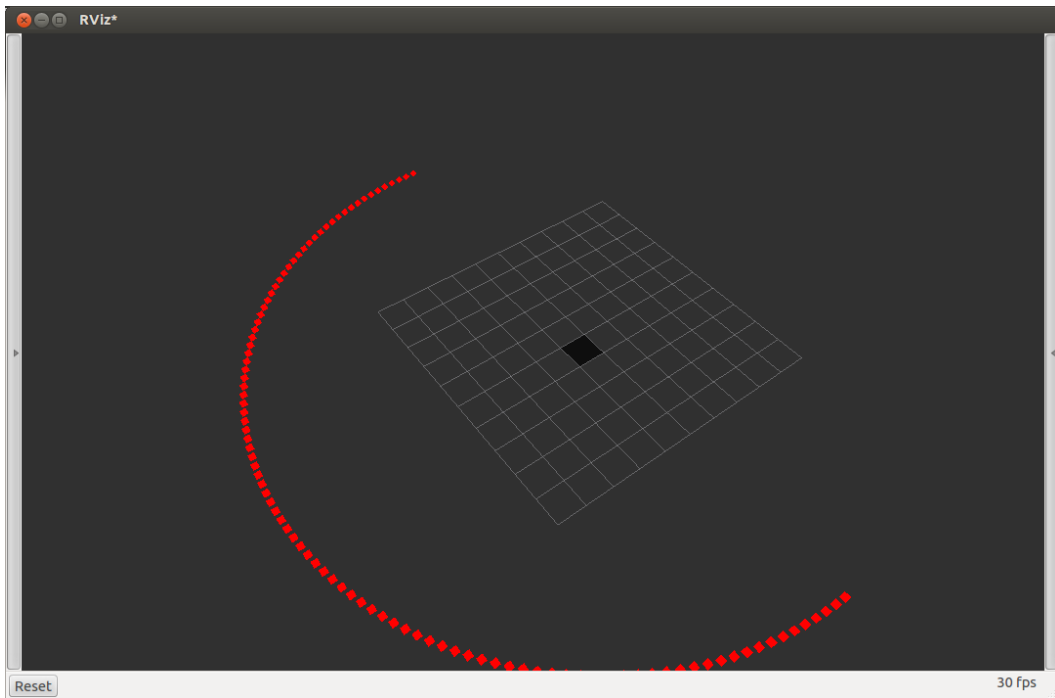
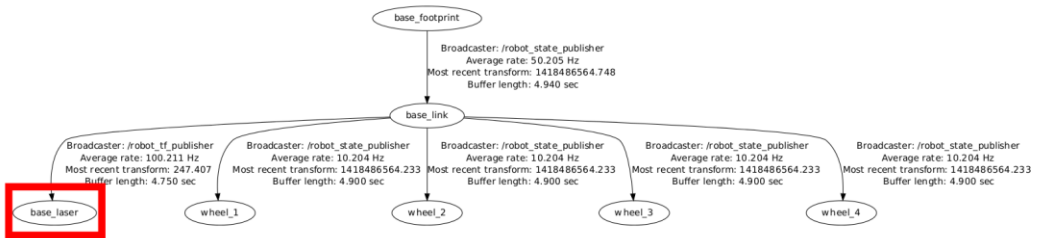
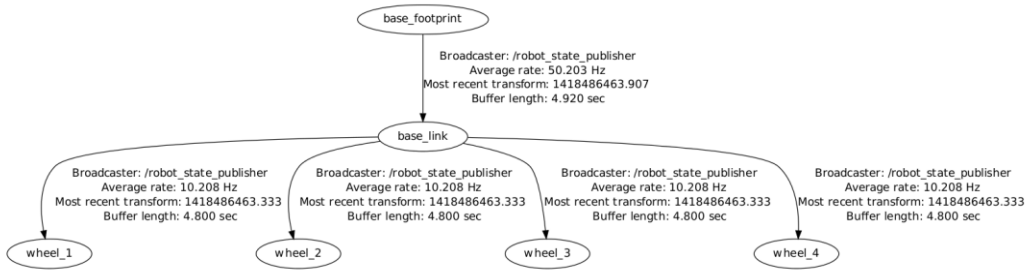




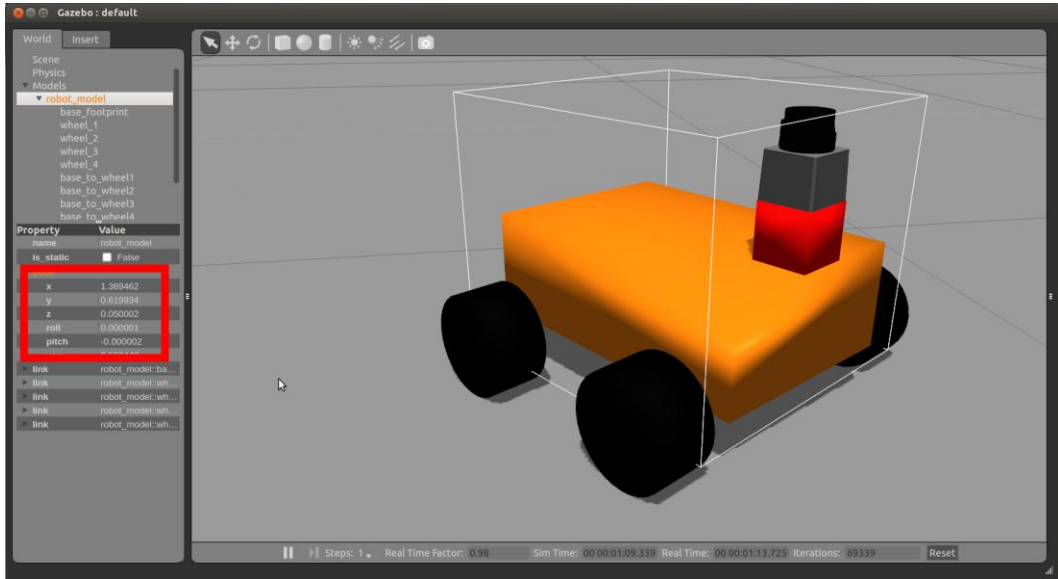


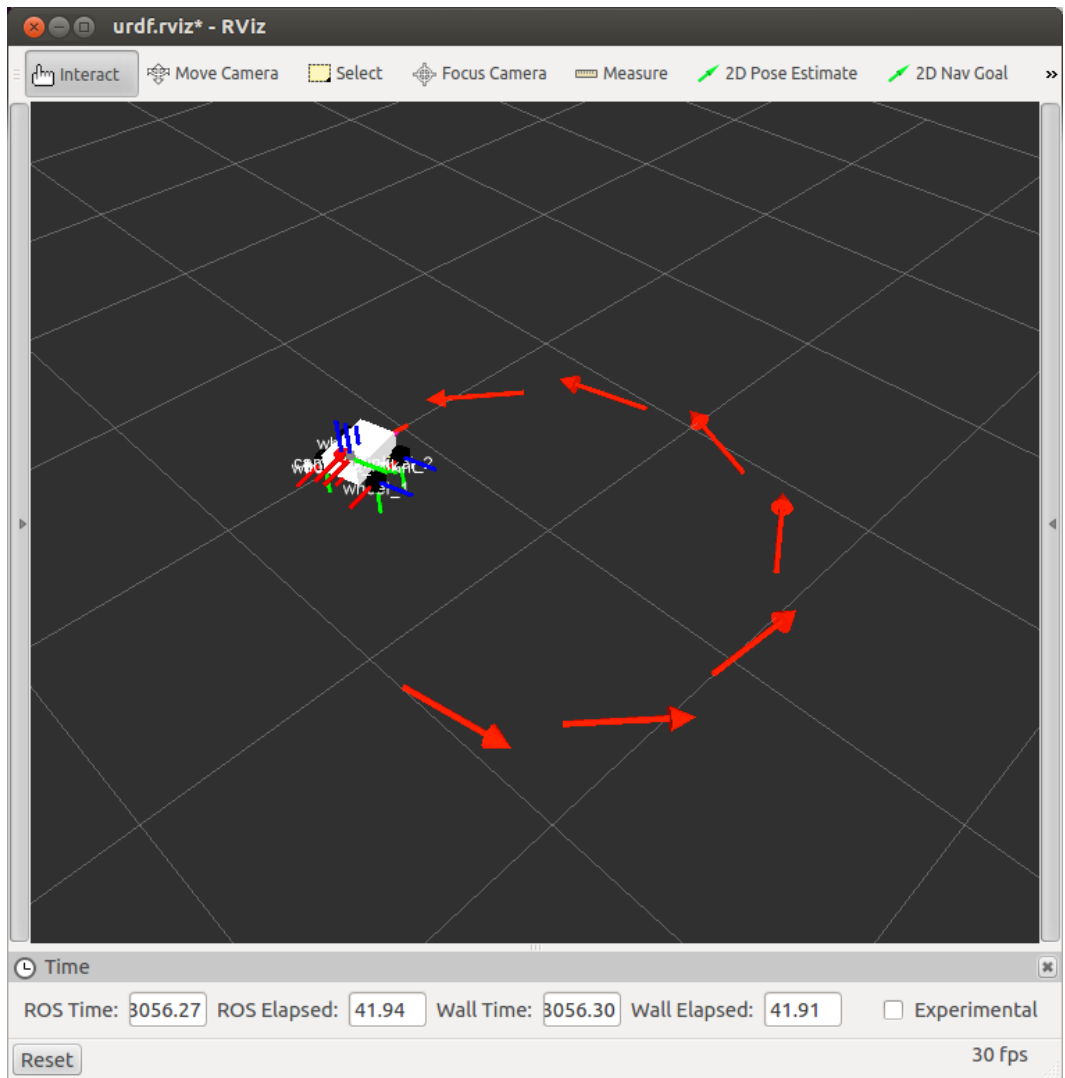
Chapter 5: The Navigation Stack – Robot Setups

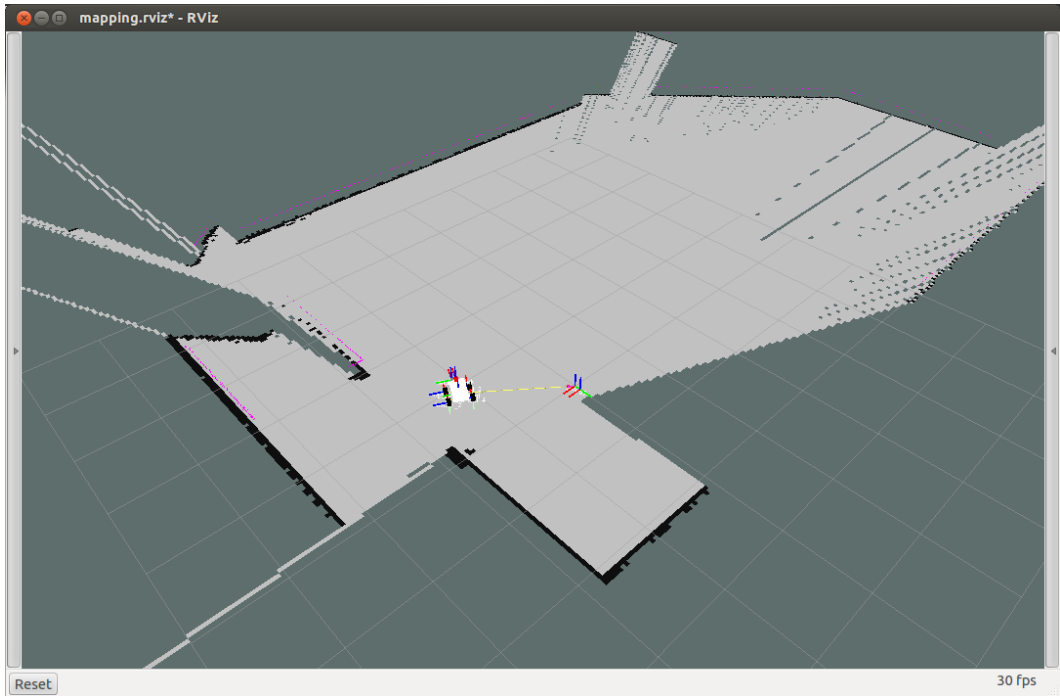
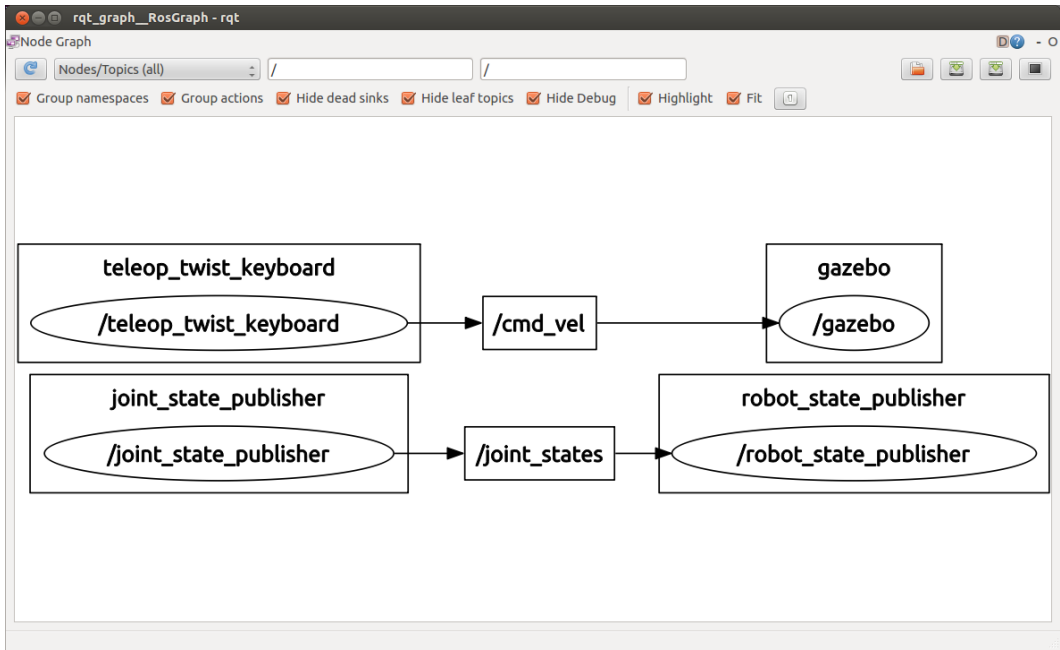




```
std_msgs/Header header
  uint32 seq
  time stamp
  string frame_id
string child_frame_id
geometry_msgs/PoseWithCovariance pose
  geometry_msgs/Pose pose
    geometry_msgs/Point position
      float64 x
      float64 y
      float64 z
    geometry_msgs/Quaternion orientation
      float64 x
      float64 y
      float64 z
      float64 w
    float64[36] covariance
geometry_msgs/TwistWithCovariance twist
  geometry_msgs/Twist twist
    geometry_msgs/Vector3 linear
      float64 x
      float64 y
      float64 z
    geometry_msgs/Vector3 angular
      float64 x
      float64 y
      float64 z
    float64[36] covariance
```

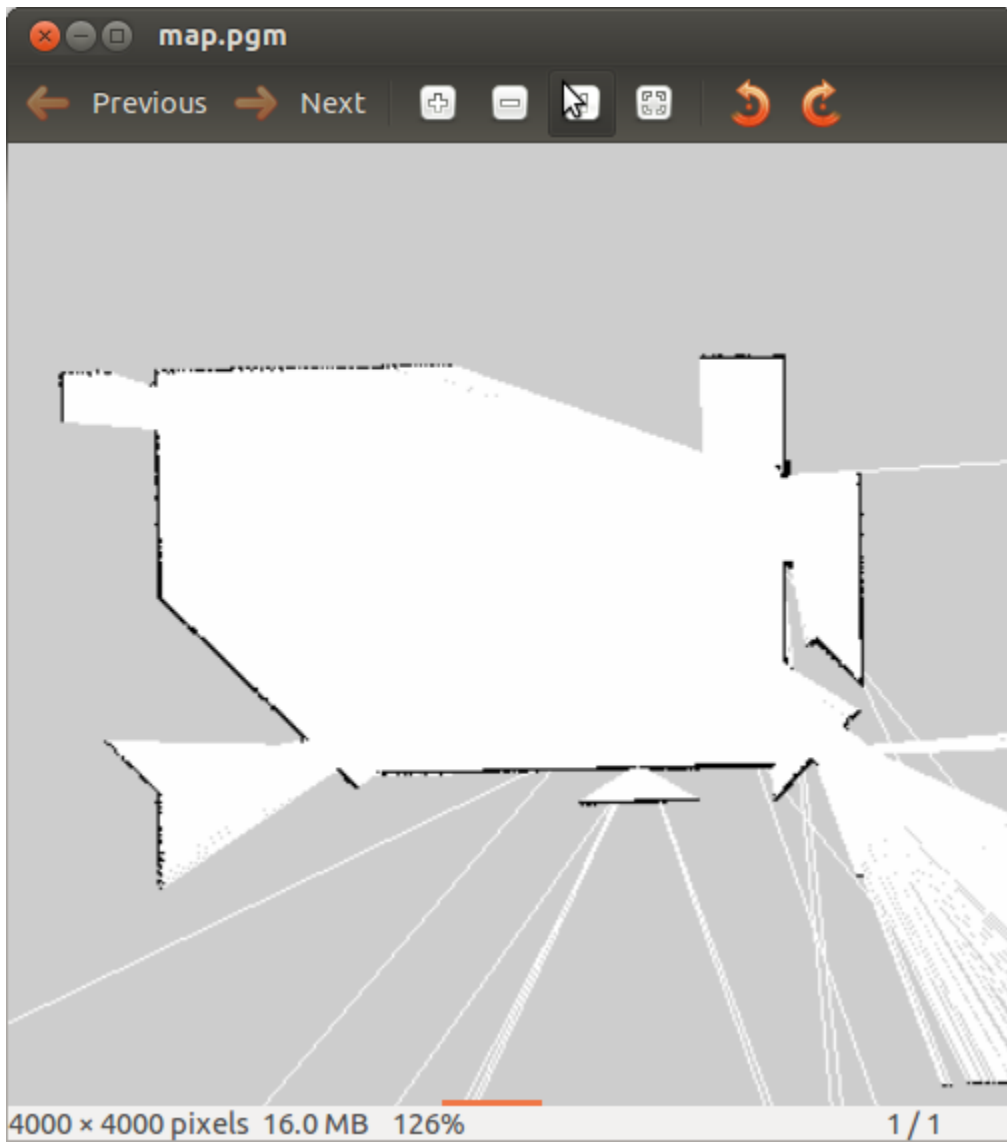




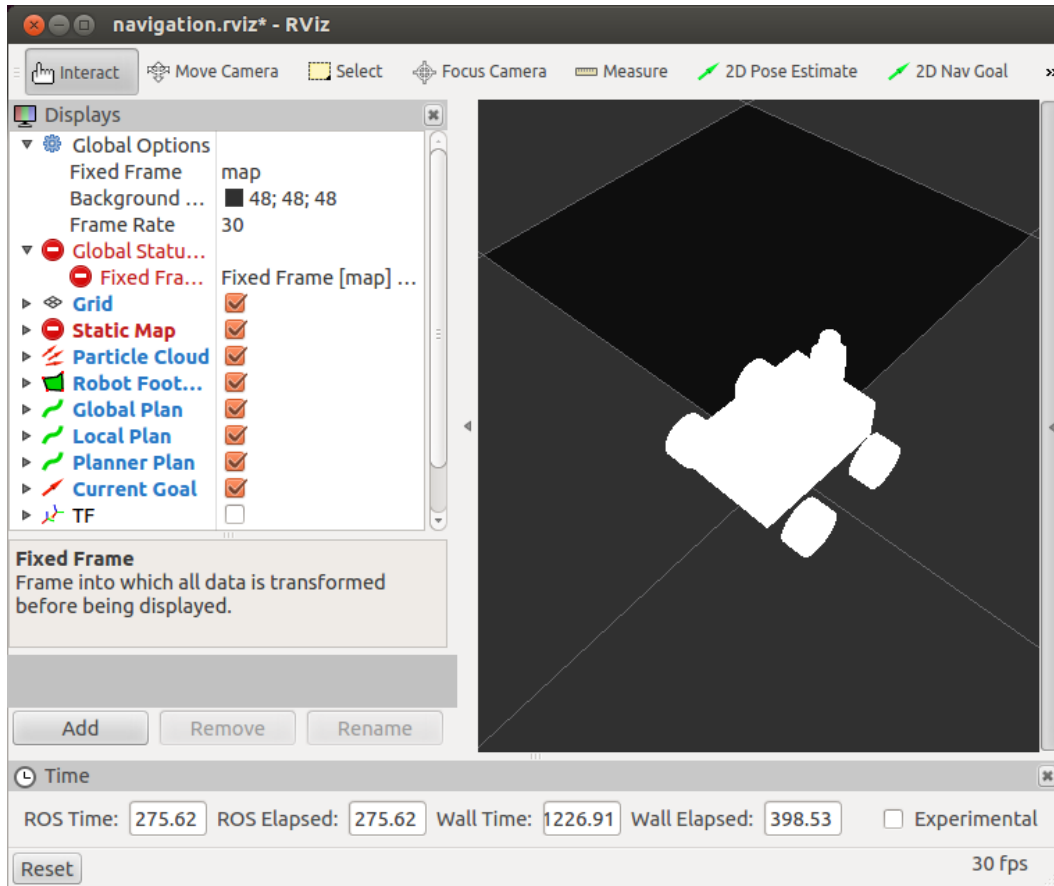


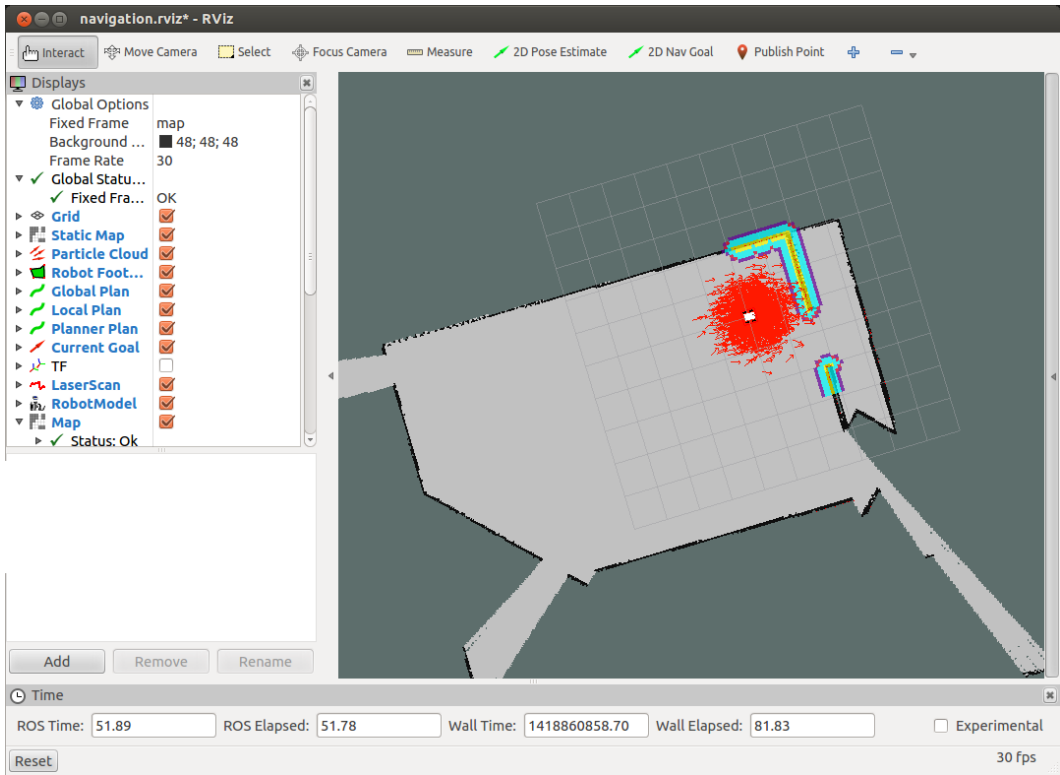
```
[ INFO] [1418594807.613374681]: Waiting for the map
[ INFO] [1418594807.958979924, 126.530000000]: Received a 4000 X 4000 map @ 0.050 m/pix
[ INFO] [1418594807.959452501, 126.530000000]: Writing map occupancy data to map.pgm
[ INFO] [1418594808.997886519, 127.085000000]: Writing map occupancy data to map.yaml
[ INFO] [1418594808.998301431, 127.085000000]: Done
```

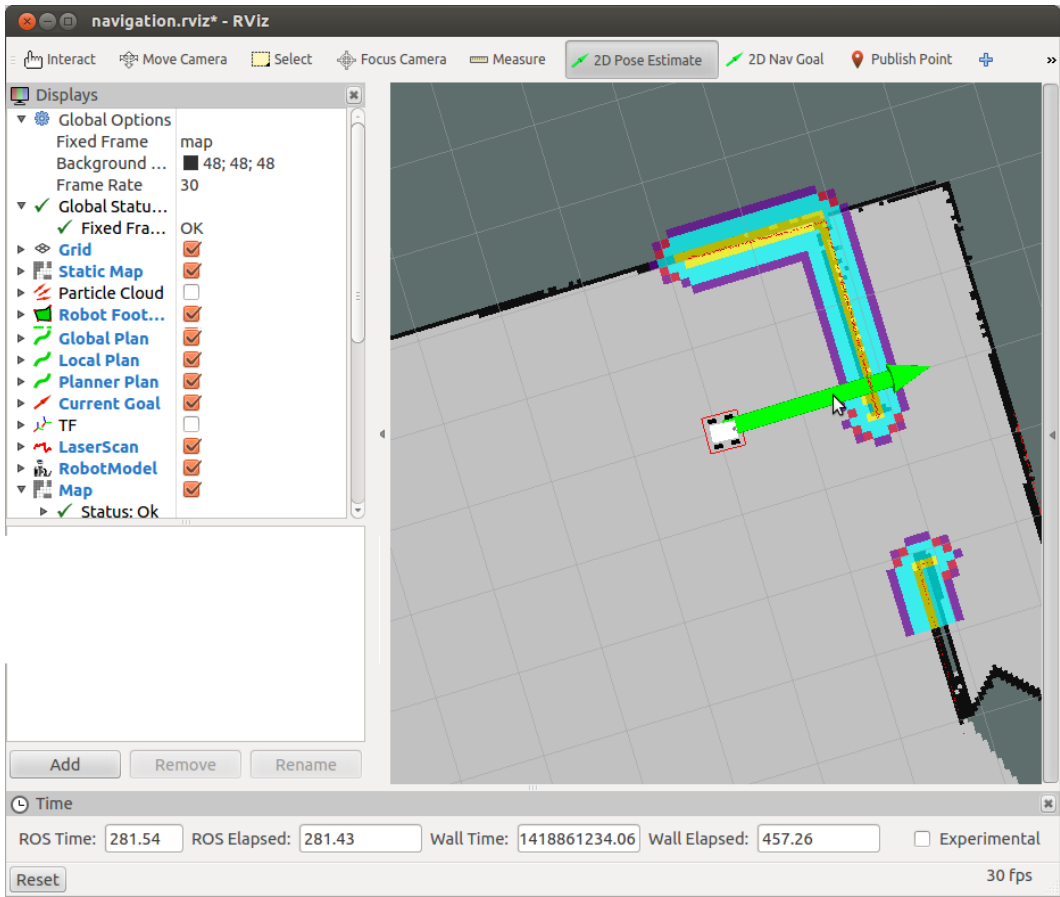
```
image: map.pgm
resolution: 0.050000
origin: [-100.000000, -100.000000, 0.000000]
negate: 0
occupied_thresh: 0.65
free_thresh: 0.196
```

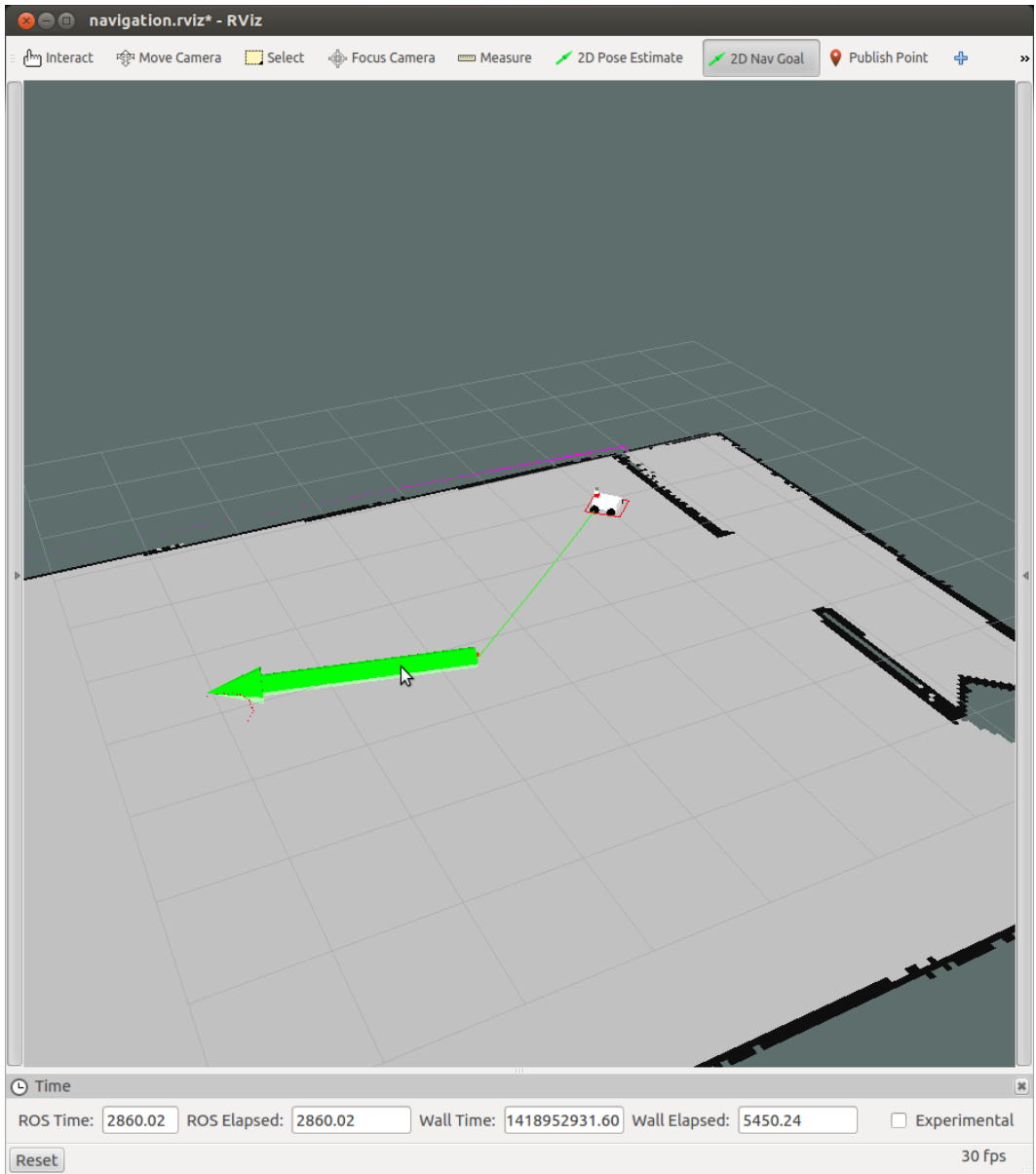


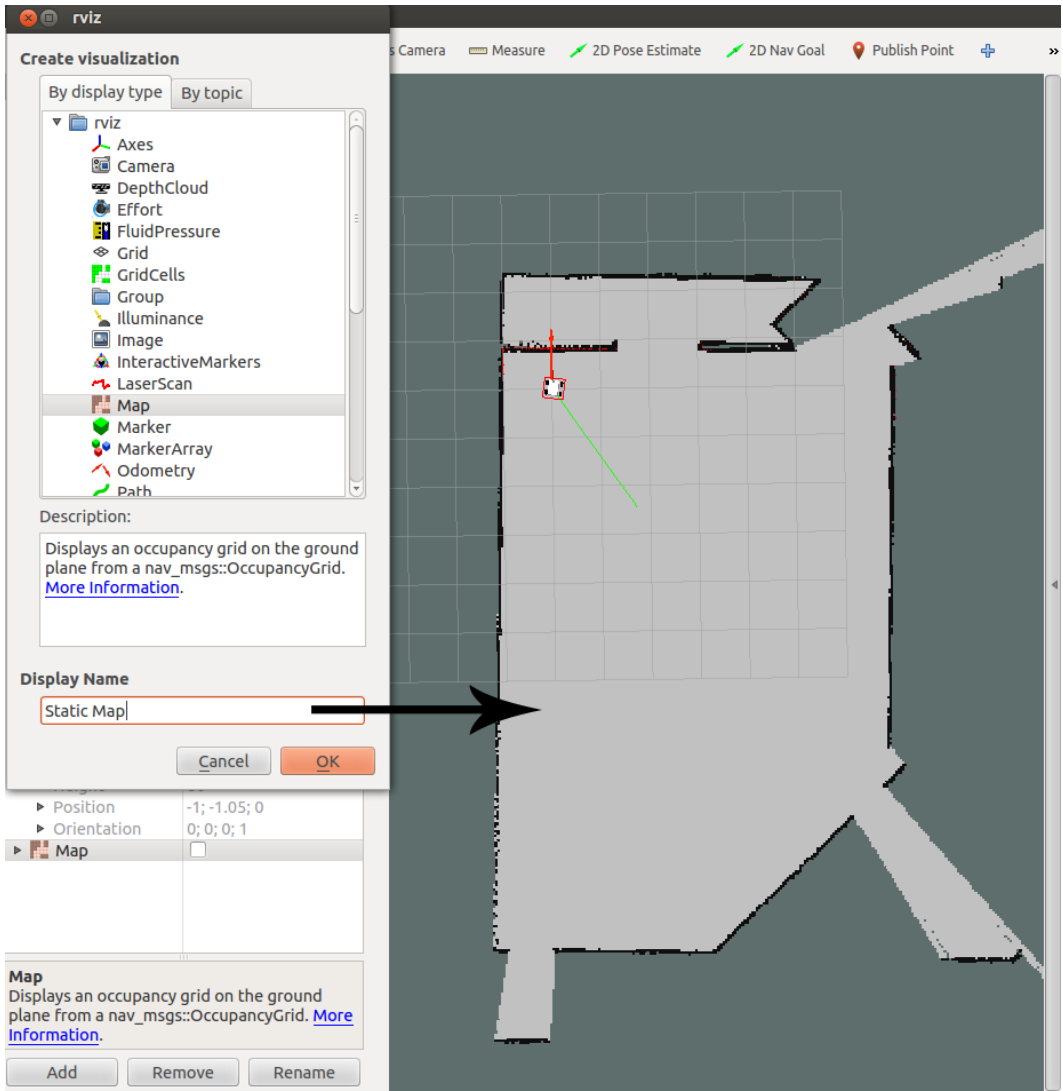
Chapter 6: The Navigation Stack – Beyond Setups

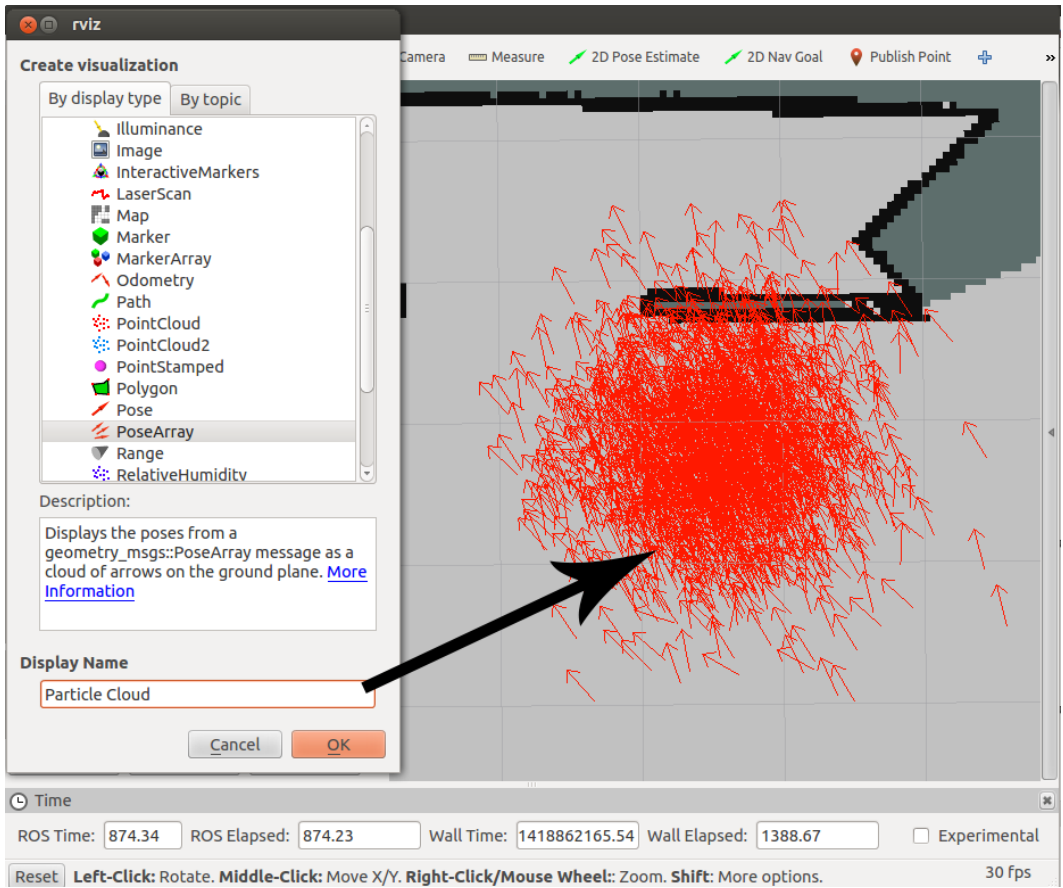


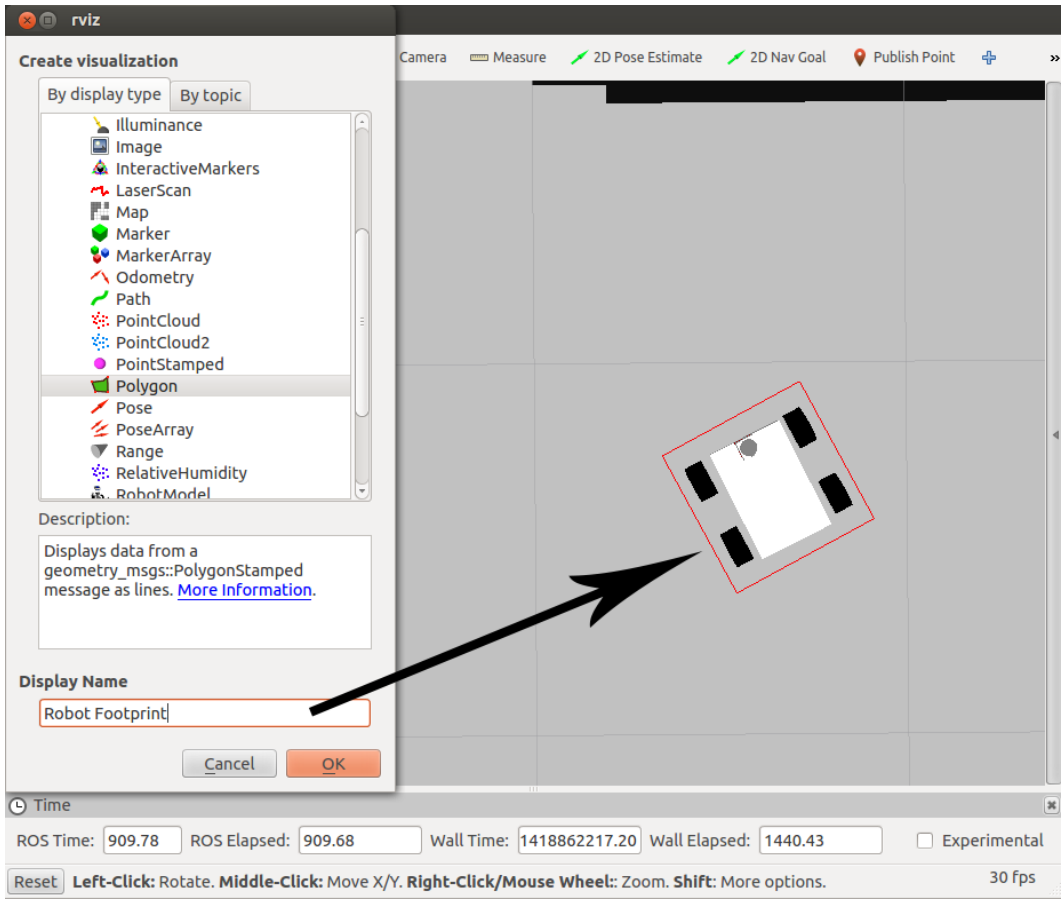


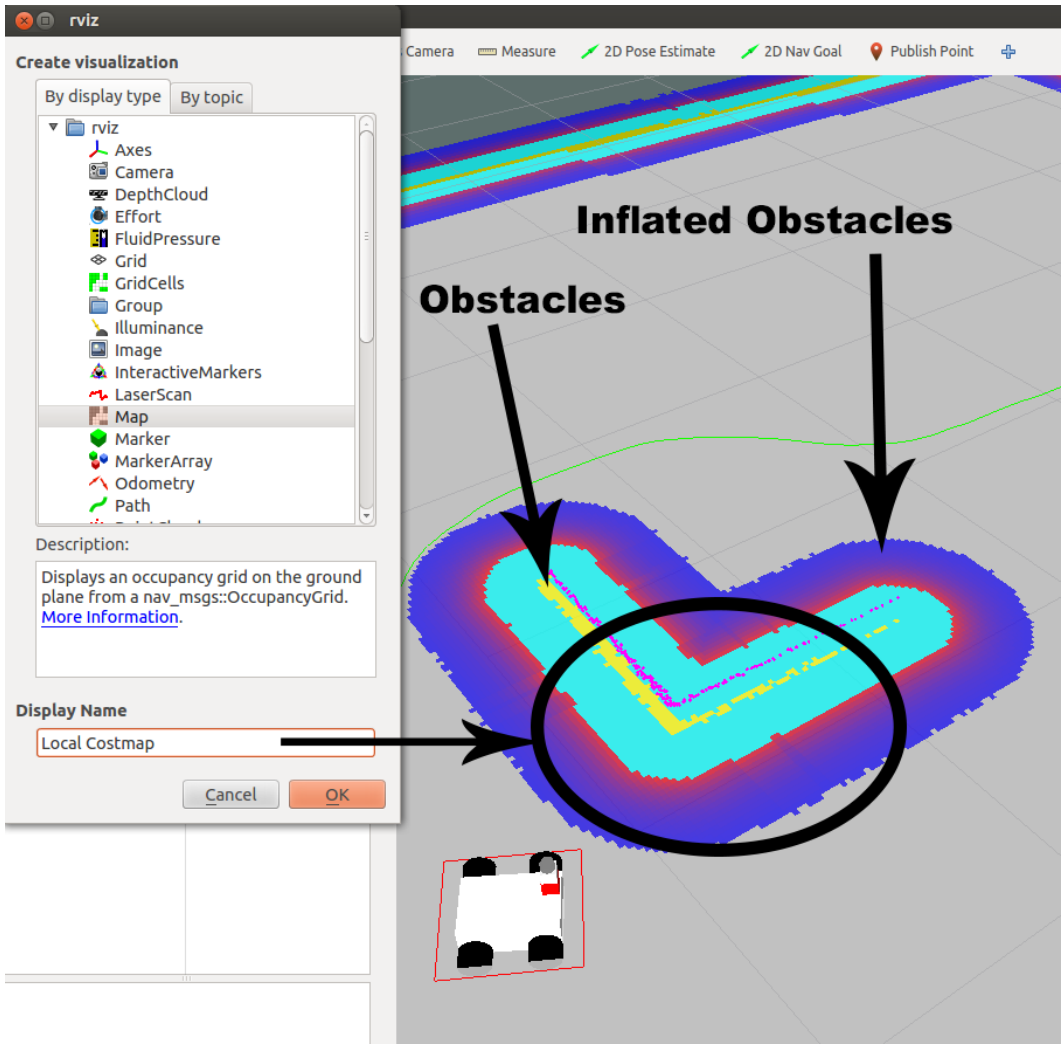


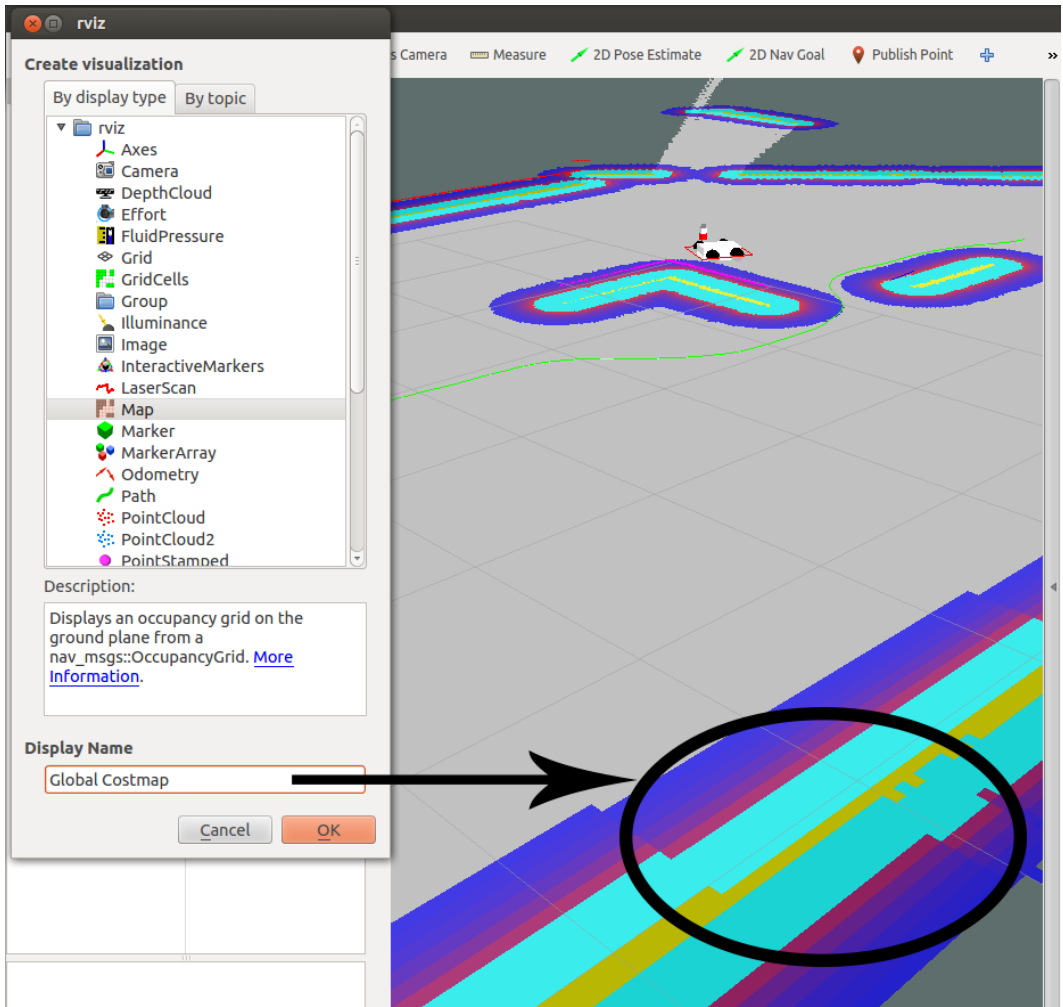


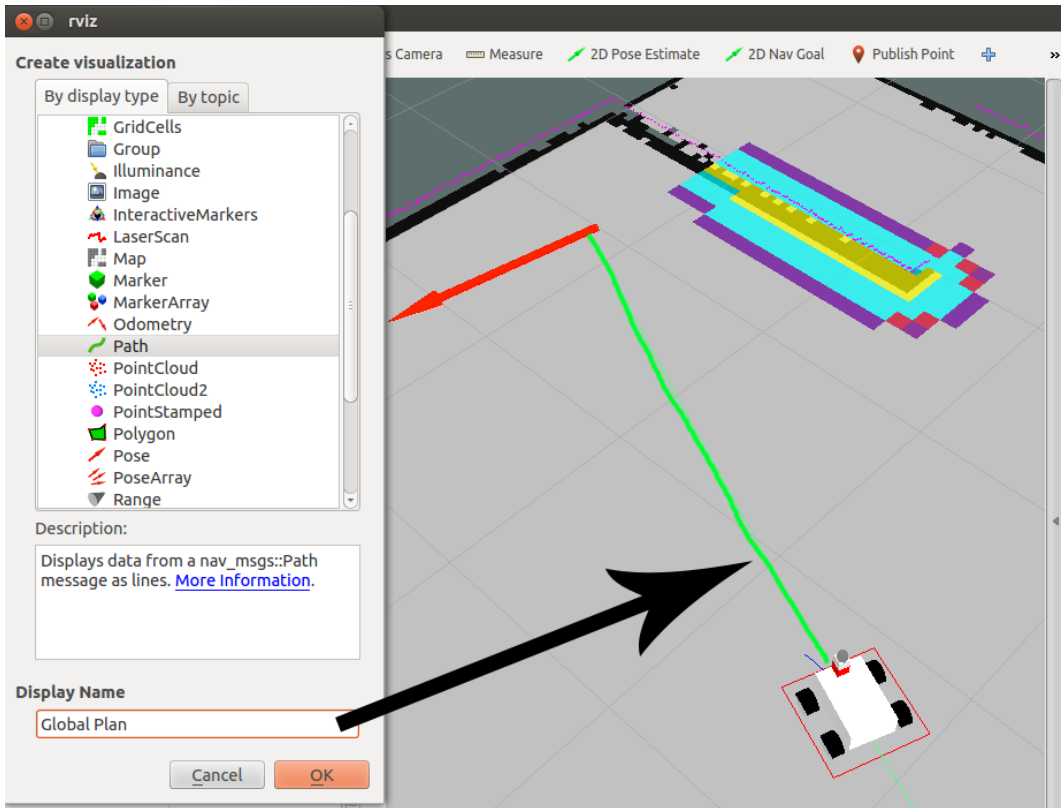


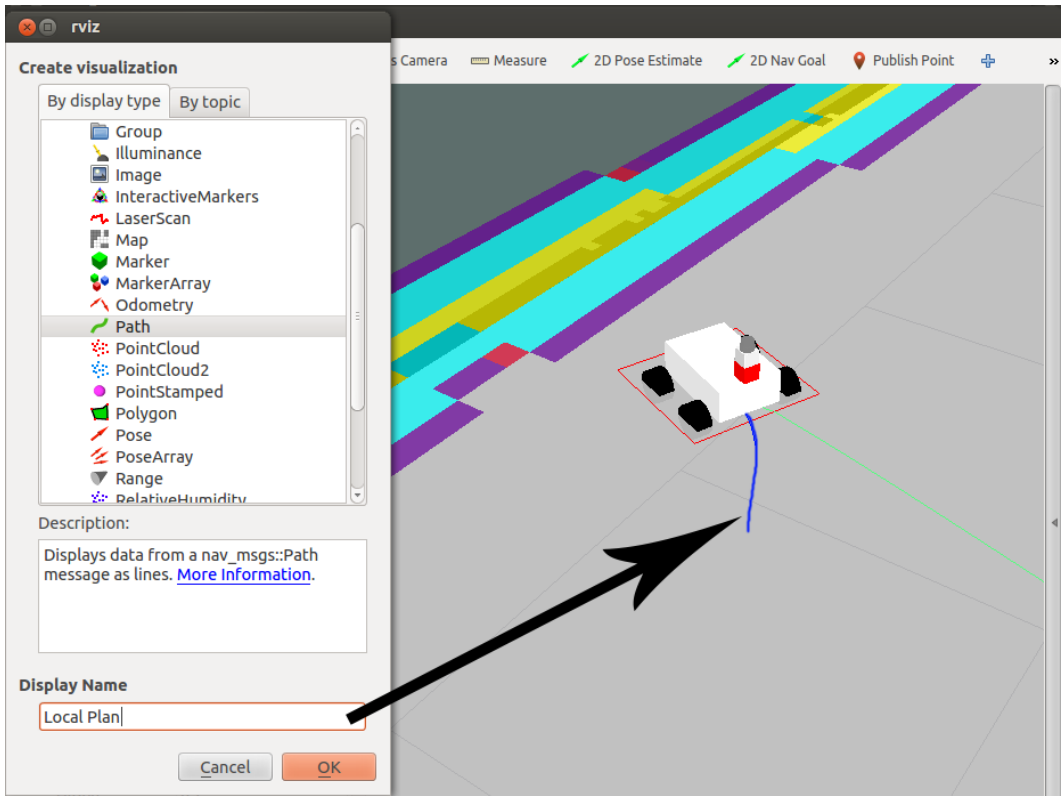


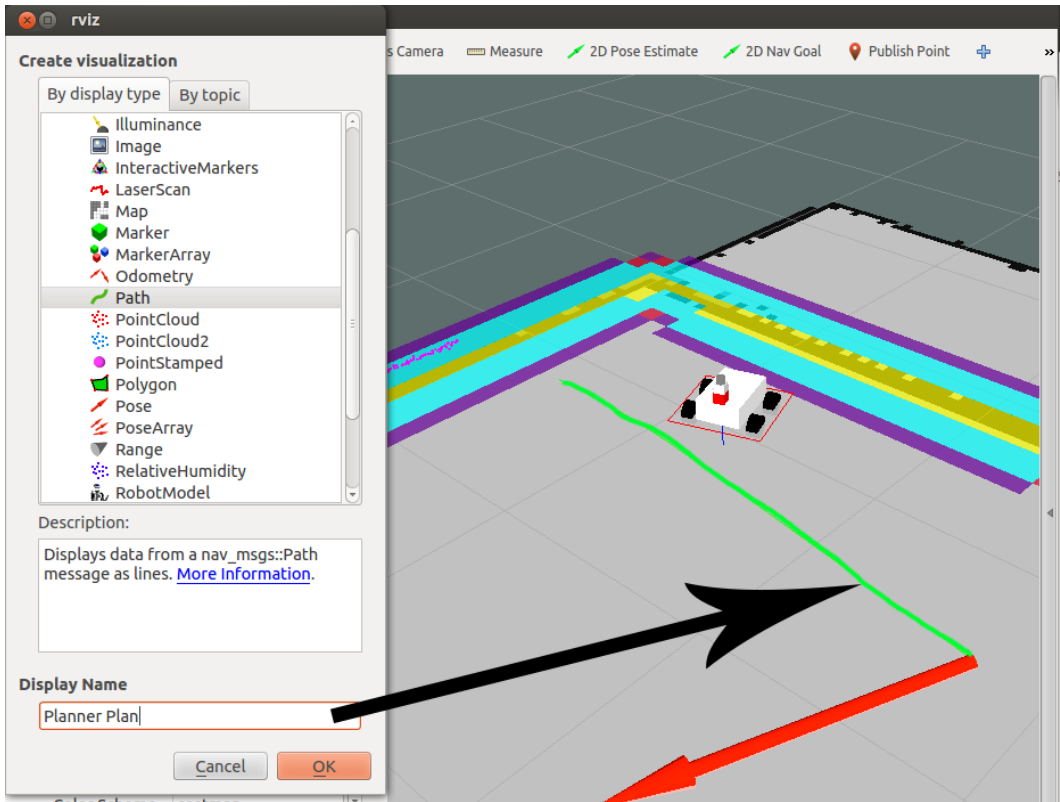


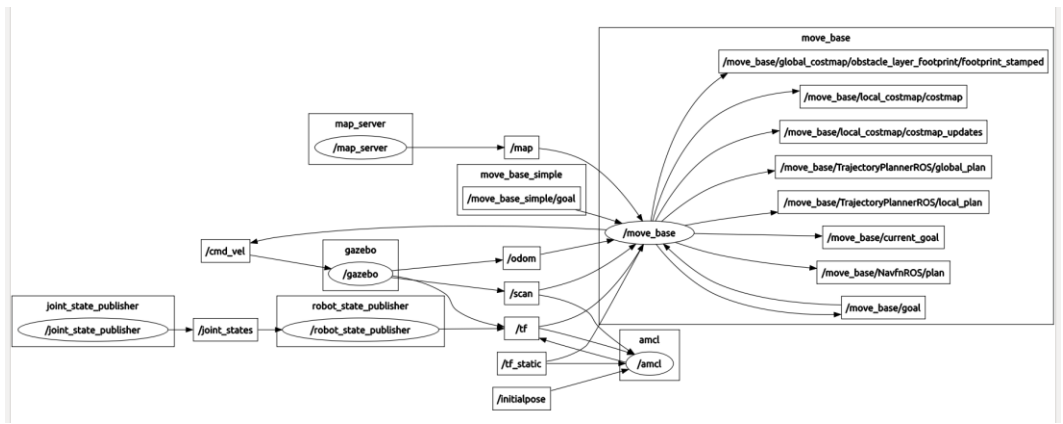
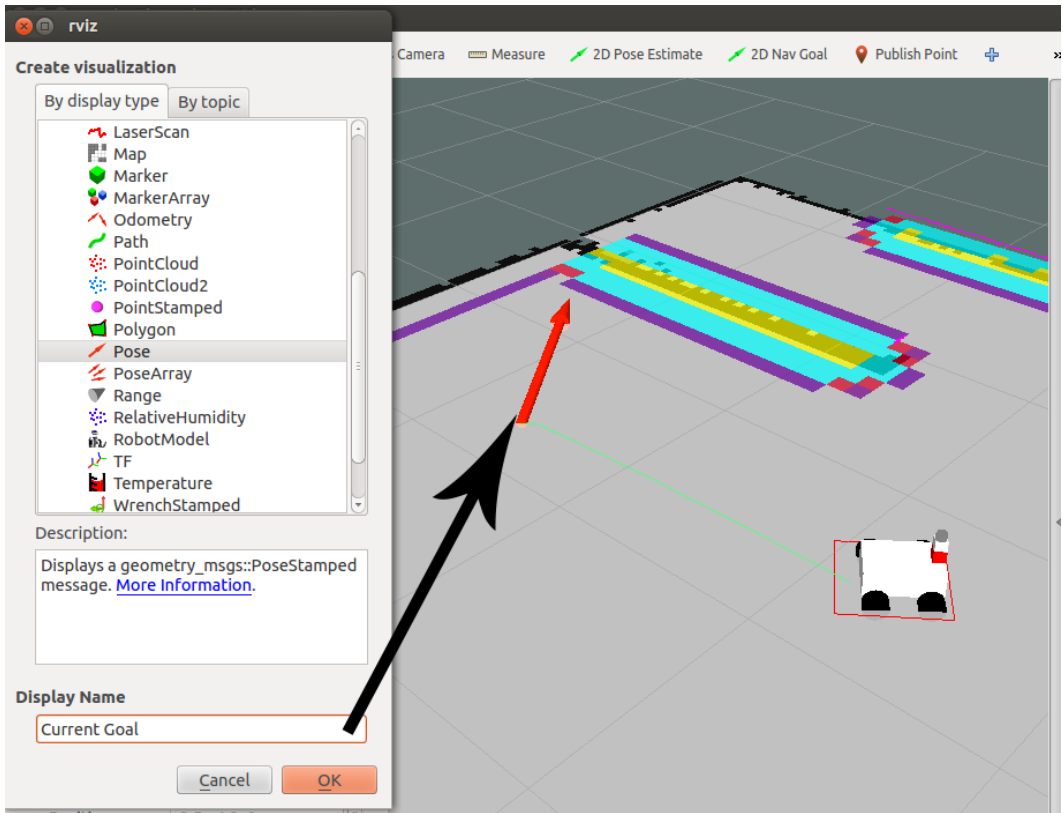


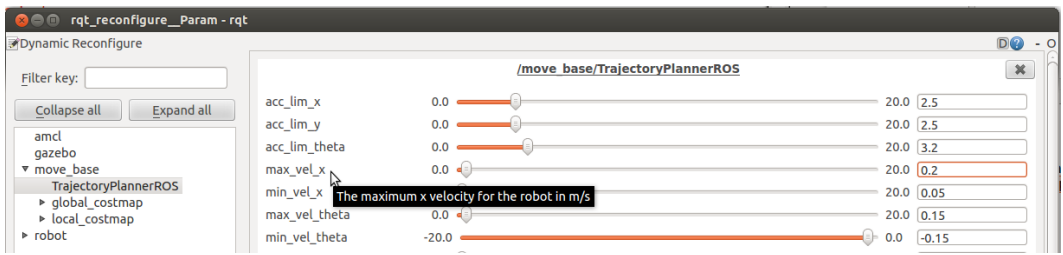
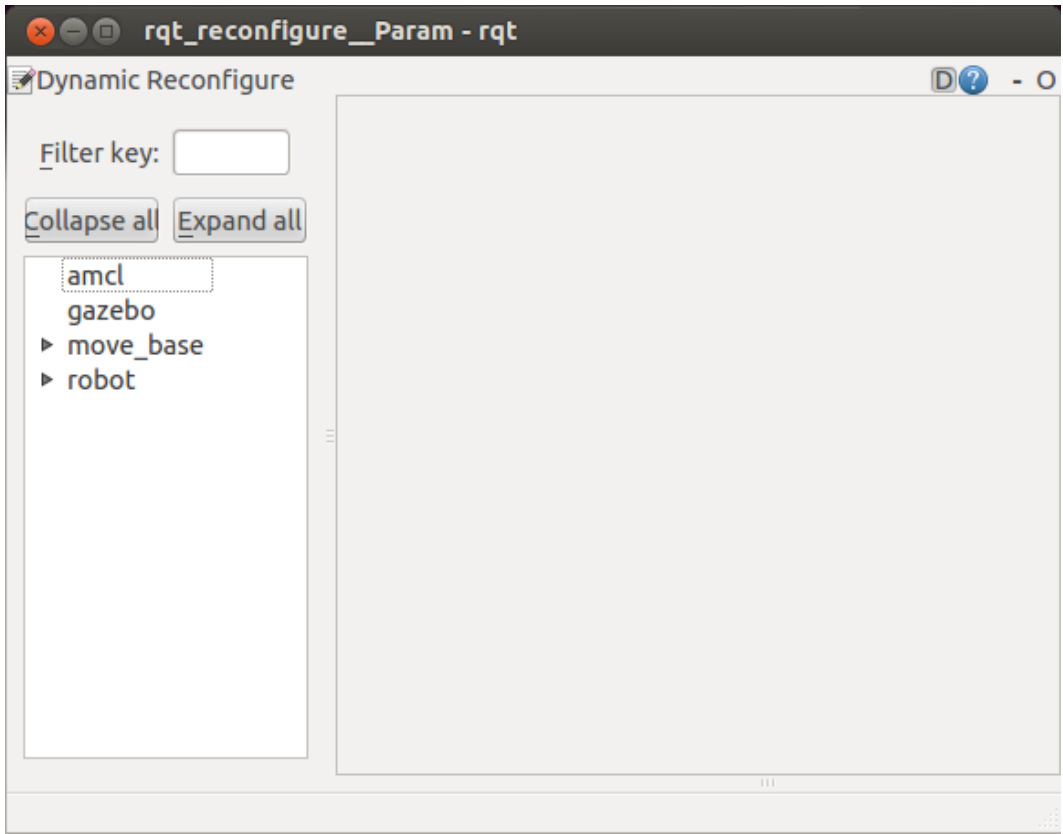


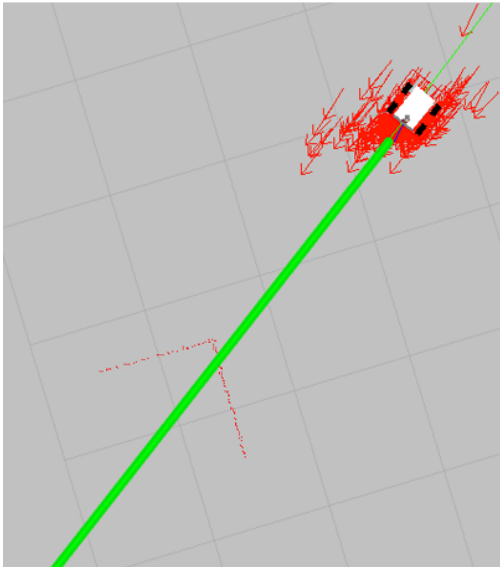
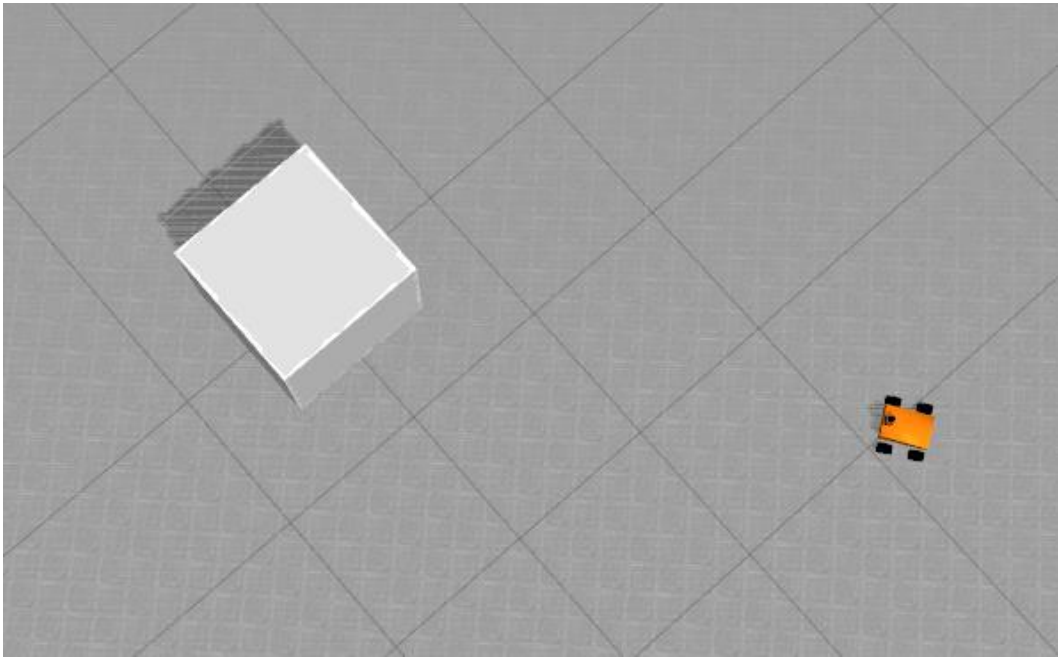


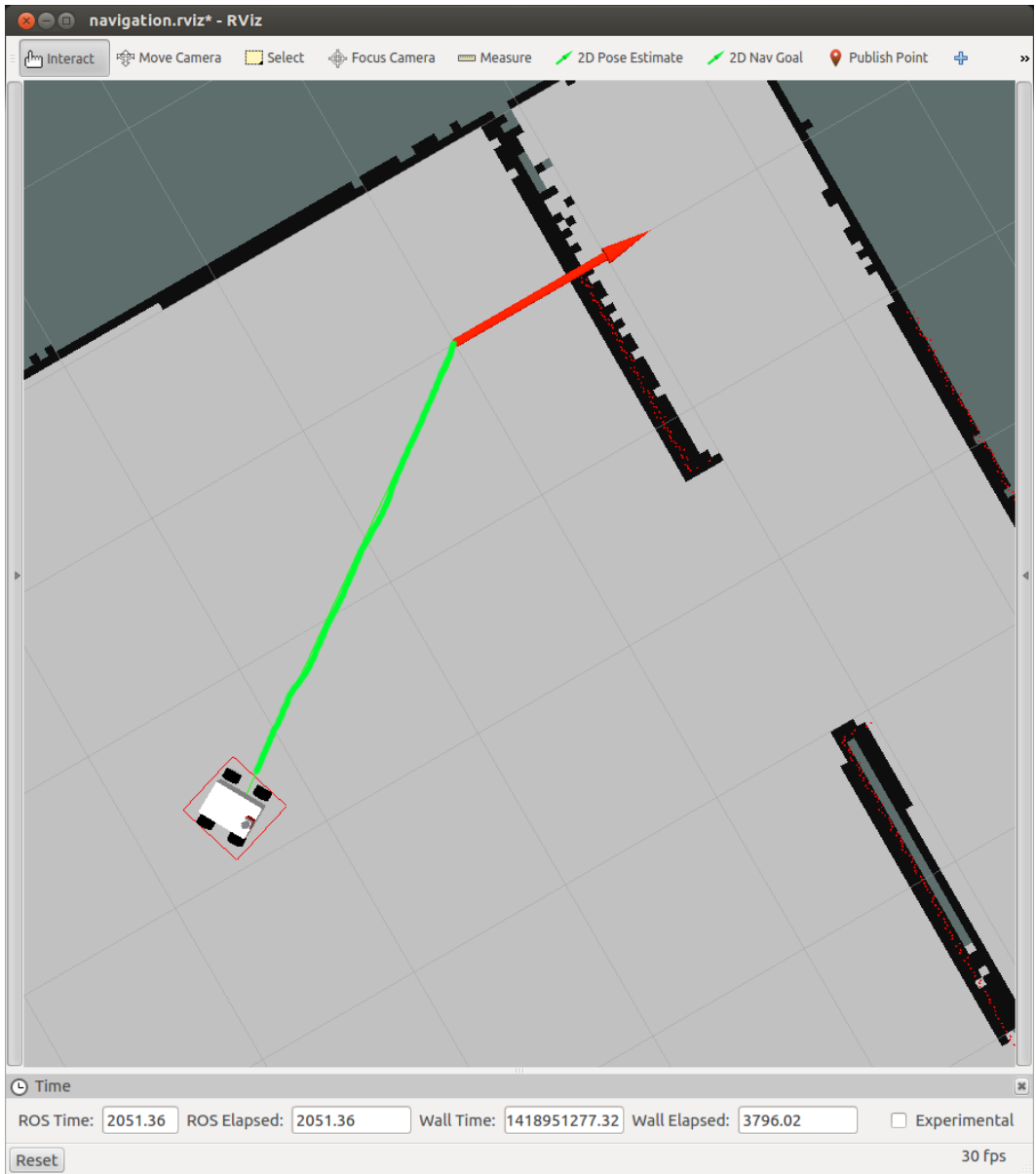




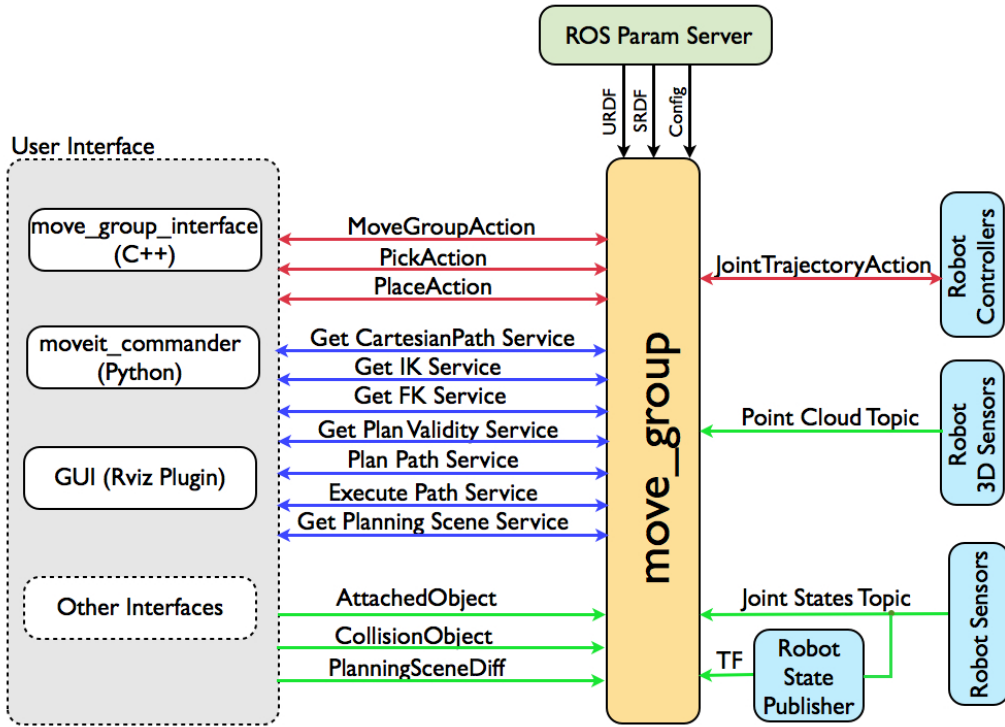


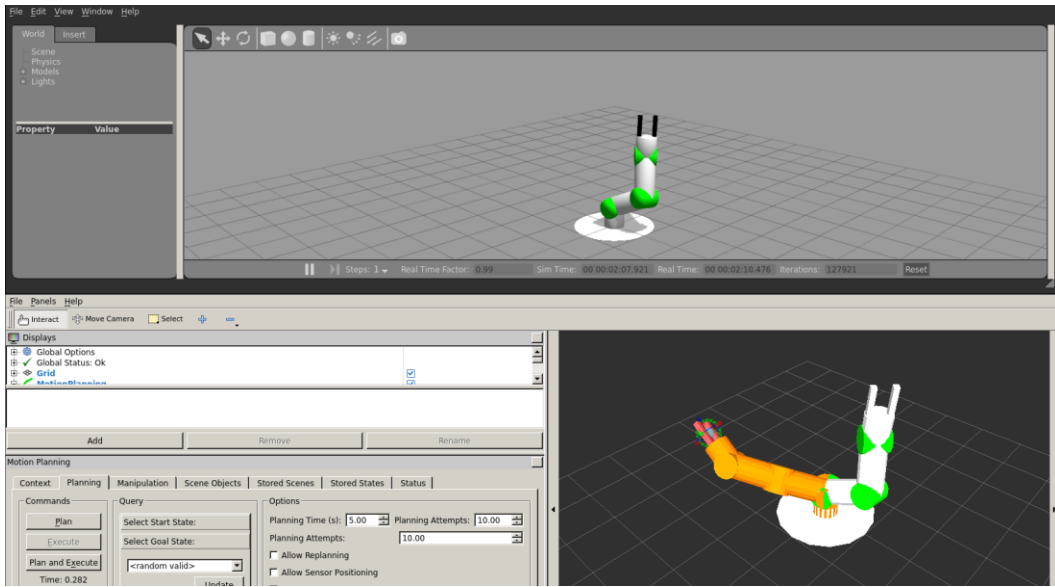




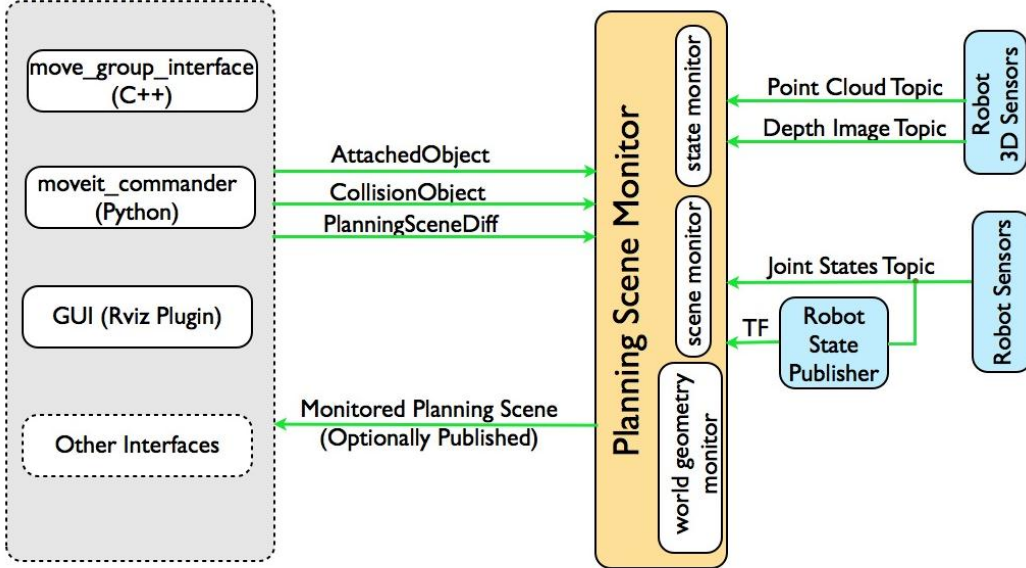


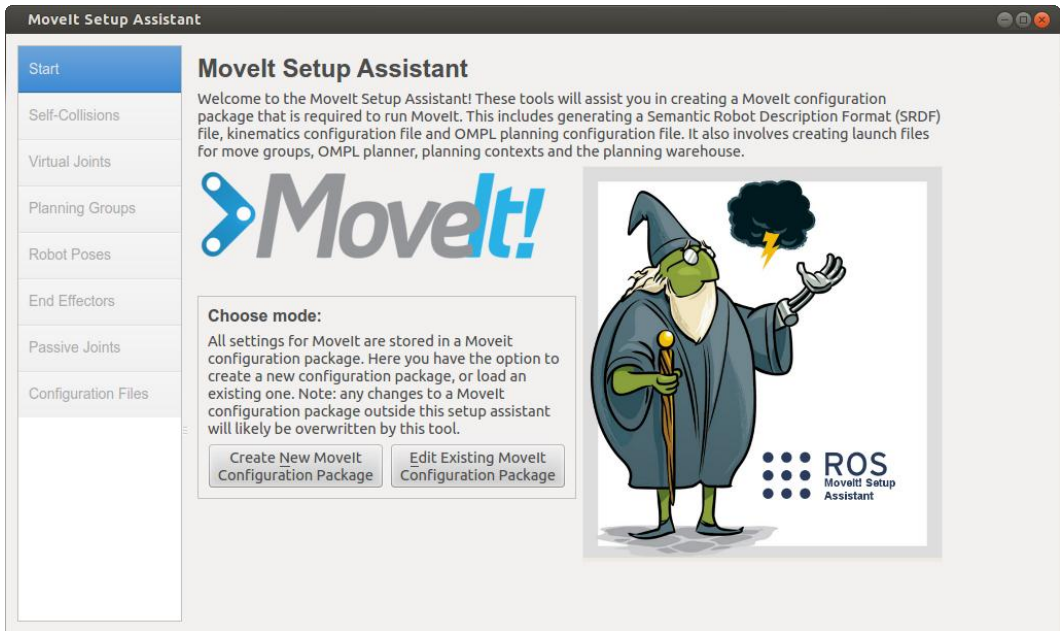
Chapter 7: Manipulation with MoveIt!





User Interface





MoveIt Setup Assistant

Start

Self-Collisions

Virtual Joints

Planning Groups

Robot Poses

End Effectors

Passive Joints

Configuration Files

Optimize Self-Collision Checking

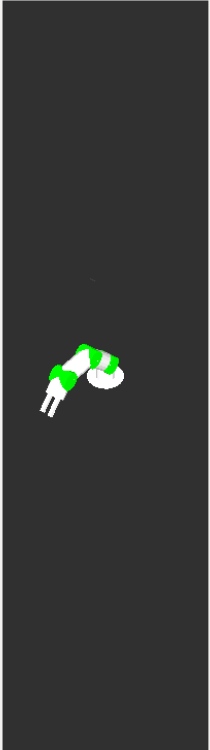
The Default Self-Collision Matrix Generator will search for pairs of links on the robot that can safely be disabled from collision checking, decreasing motion planning processing time. These pairs of links are disabled when they are always in collision, never in collision, in collision in the robot's default position or when the links are adjacent to each other on the kinematic chain. Sampling density specifies how many random robot positions to check for self collision. Higher densities require more computation time.

Sampling Density: Low High 10000

Regenerate Default Collision Matrix

	Link A	Link B	Disabled	Reason To Disable
1	base_link	rotor_0_link	<input checked="" type="checkbox"/>	Never in Collision
2	base_link	rotor_1_link	<input checked="" type="checkbox"/>	Never in Collision
3	base_link	rotor_2_link	<input checked="" type="checkbox"/>	Never in Collision
4	base_link	shoulder_link	<input checked="" type="checkbox"/>	Adjacent Links
5	base_link	upper_arm_link	<input checked="" type="checkbox"/>	Never in Collision
6	finger_1_link	finger_2_link	<input checked="" type="checkbox"/>	Never in Collision
7	finger_1_link	forearm_link	<input checked="" type="checkbox"/>	Never in Collision
8	finger_1_link	rotor_0_link	<input checked="" type="checkbox"/>	Never in Collision
9	finger_1_link	rotor_1_link	<input checked="" type="checkbox"/>	Never in Collision
10	finger_1_link	rotor_2_link	<input checked="" type="checkbox"/>	Never in Collision
11	finger_1_link	shoulder_link	<input checked="" type="checkbox"/>	Never in Collision
12	finger_1_link	tool_link	<input checked="" type="checkbox"/>	Adjacent Links
13	finger_1 link	upper arm link	<input checked="" type="checkbox"/>	Never in Collision

Show Non-Disabled Link Pairs Min. collisions for "always"-colliding pai 95%



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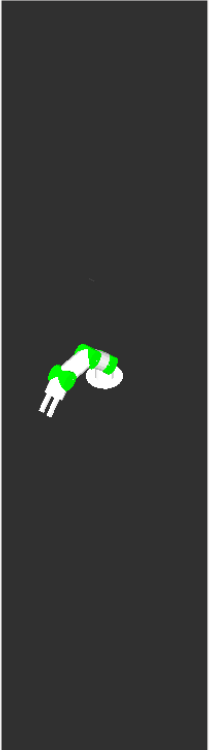
Configuration Files

Virtual Joints

Define a virtual joint between a robot link and an external frame of reference (considered fixed with respect to the robot).

Virtual Joint Name	Child Link	Parent Frame	Type
--------------------	------------	--------------	------

Delete Selected Add Virtual Joint



MoveIt Setup Assistant

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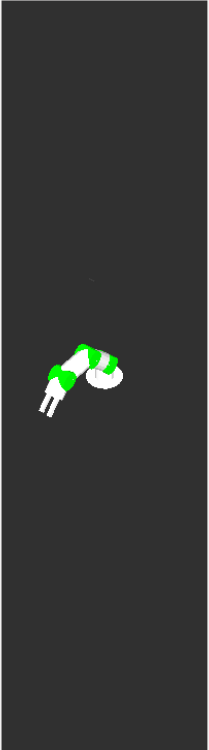
Planning Groups

Create and edit planning groups for your robot based on joint collections, link collections, kinematic chains and subgroups.

Current Groups

- ▼ **arm**
 - ▼ *Joints*
 - shoulder_joint - Revolute
 - rotor_0_joint - Revolute
 - upper_arm_joint - Revolute
 - rotor_1_joint - Revolute
 - forearm_joint - Revolute
 - rotor_2_joint - Revolute
 - tool_joint - Revolute
 - grasping_frame_joint - Fixed
 - Links*
 - Chain*
 - Subgroups*
- ▼ **gripper**
 - ▼ *Joints*
 - finger_1_joint - Prismatic
 - finger_2_joint - Prismatic
 - Links*
 - Chain*
 - Subgroups*

[Expand All](#) [Collapse All](#)



MoveIt Setup Assistant

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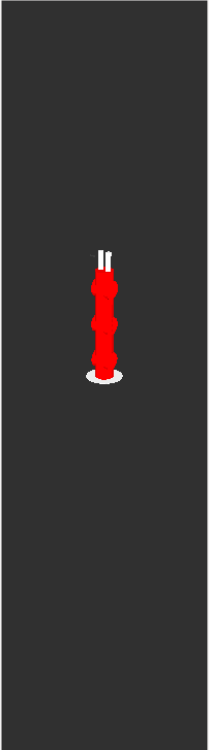
Passive Joints

Configuration Files

Robot Poses

Create poses for the robot. Poses are defined as sets of joint values for particular planning groups. This is useful for things like *folded arms*.

	Pose Name	Group Name
1	home	arm
2	grasp	arm



Show Default Pose MoveIt! Edit Selected Delete Selected Add Pose

MoveIt Setup Assistant

Start

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End Effectors

Passive Joints

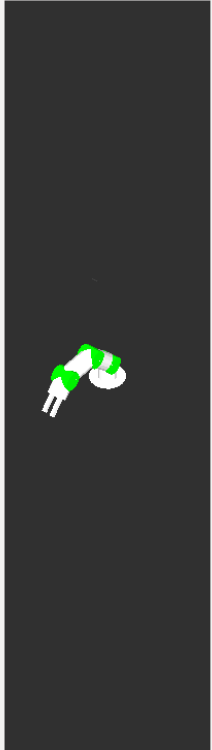
Configuration Files

End Effectors

Setup grippers and other end effectors for your robot

	End Effector Name	Group Name	Parent Link	Parent Group
1	gripper_eef	gripper	grasping_frame	

Edit Selected Delete Selected Add End Effector



MoveIt Setup Assistant

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Passive Joints

Configuration Files

Passive Joints

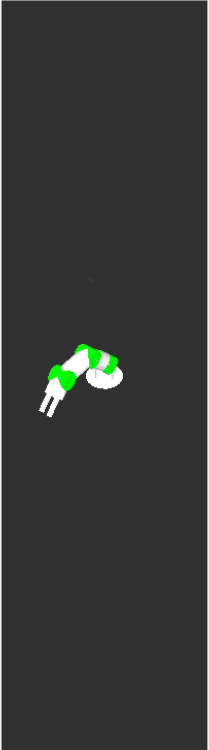
Specify the set of passive joints (not actuated). Joint state is not expected to be published for these joints.

Active Joints

	Joint Names
1	shoulder_joint
2	rotor_0_joint
3	upper_arm_joint
4	rotor_1_joint
5	forearm_joint
6	rotor_2_joint
7	tool_joint
8	finger_1_joint
9	finger_2_joint

Passive Joints

Joint Names



MovelIt Setup Assistant

Generate Configuration Files

Create or update the configuration files package needed to run your robot with MovelIt. Uncheck files to disable them from being generated - this is useful if you have made custom changes to them. Files in orange have been automatically detected as changed.

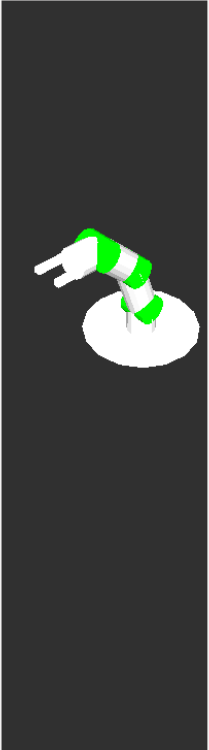
Configuration Package Save Path

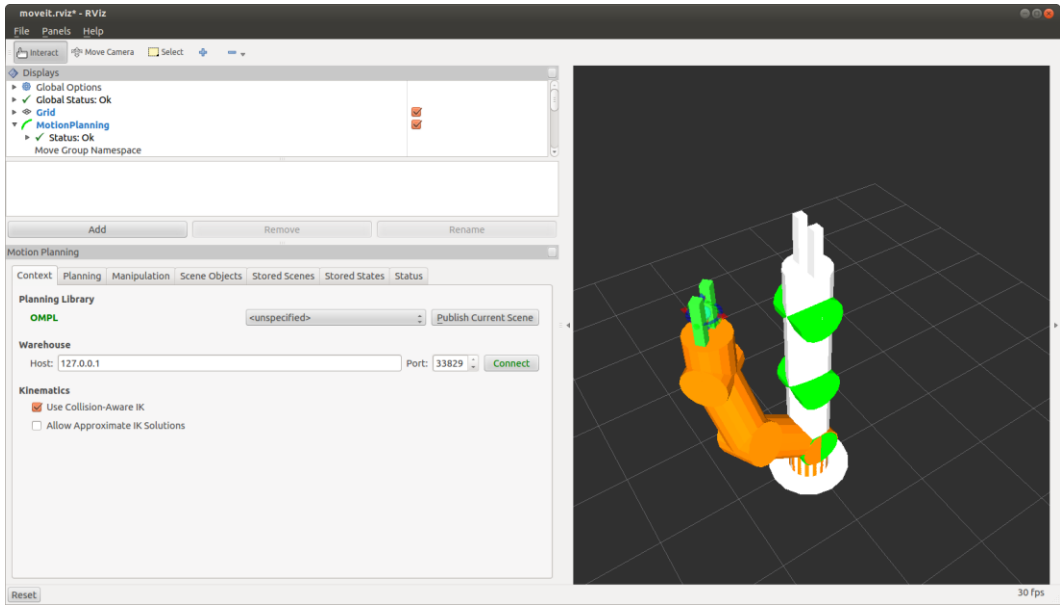
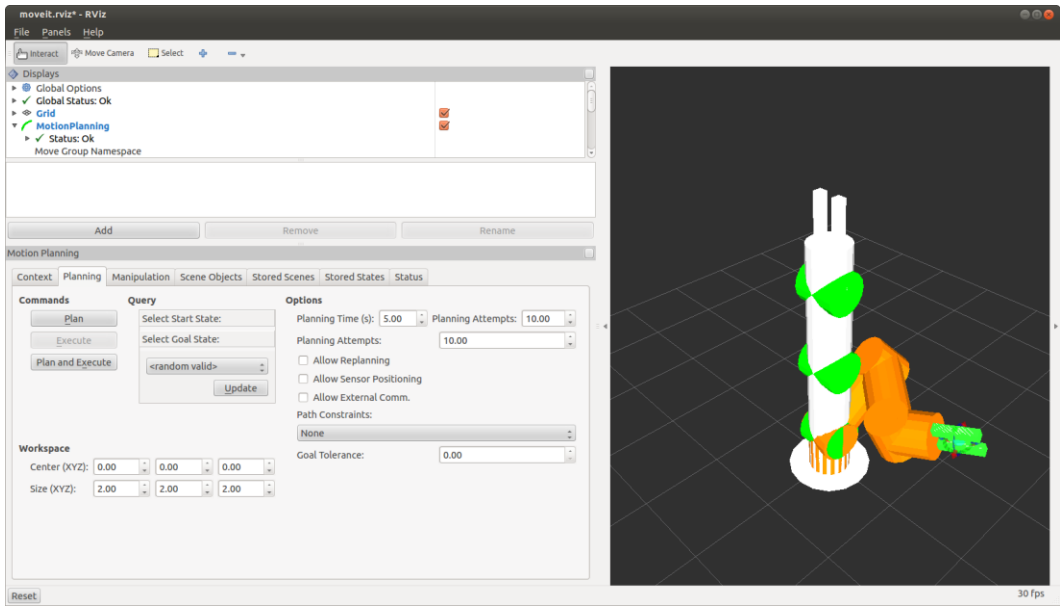
Specify the desired directory for the MovelIt configuration package to be generated. Overwriting an existing configuration package directory is acceptable. Example: `/u/robot/ros/pr2_moveit_config`

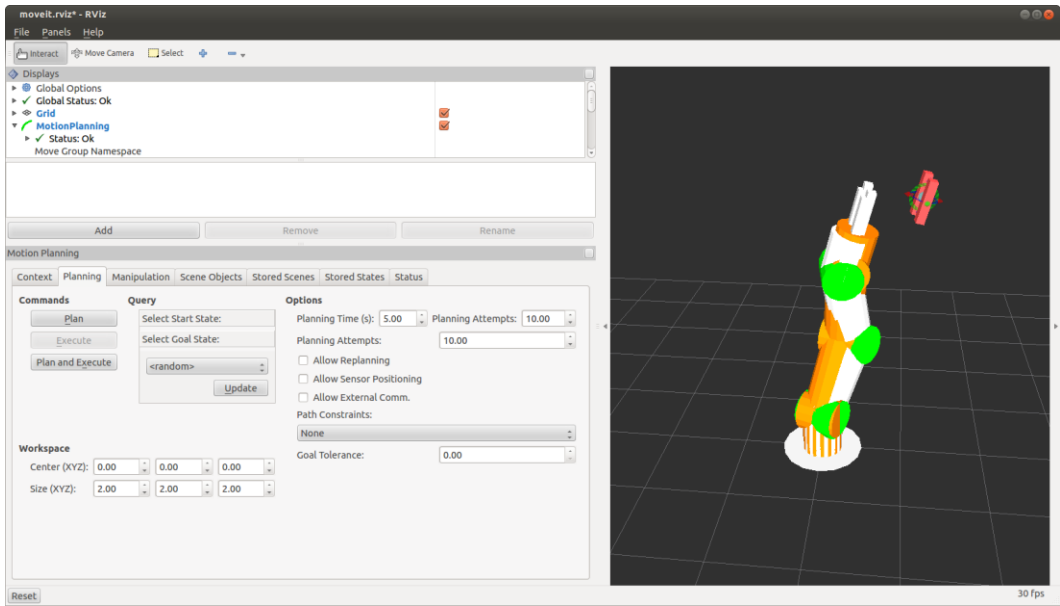
Files to be generated: (checked)

- package.xml
- CMakeLists.txt
- config/
- config/rosbook_arm.srdf
- config/ompl_planning.yaml
- config/kinematics.yaml
- config/joint_limits.yaml
- config/fake_controllers.yaml
- launch/
- launch/move_group.launch
- launch/planning_context.launch
- launch/moveit_rviz.launch
- launch/ompl_planning_pipeline.launch.xml
- launch/planning_pipeline.launch.xml
- launch/warehouse_settings.launch.xml
- launch/warehouse.launch
- launch/default_warehouse_db.launch

Defines a ROS package

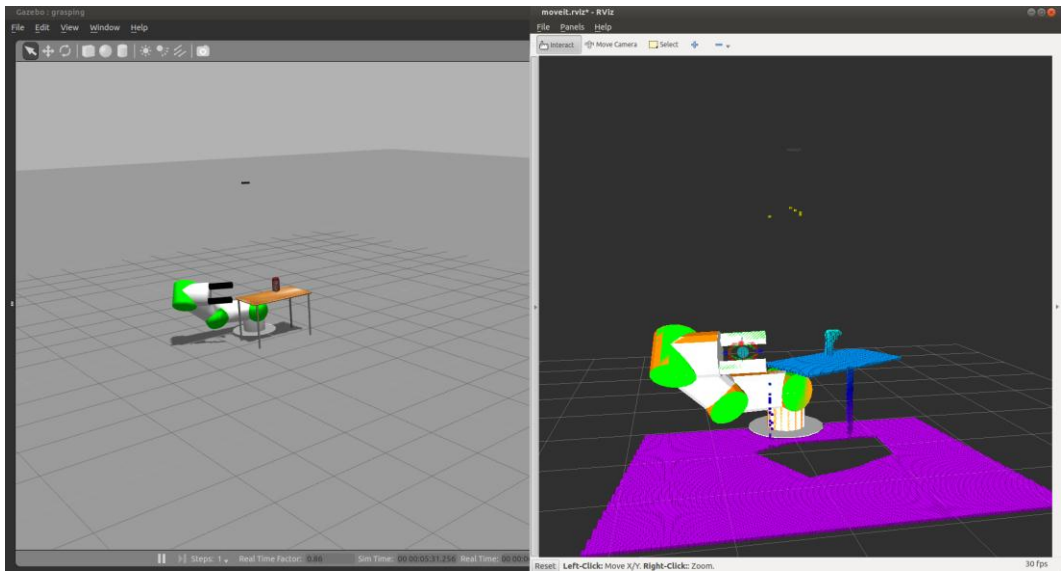
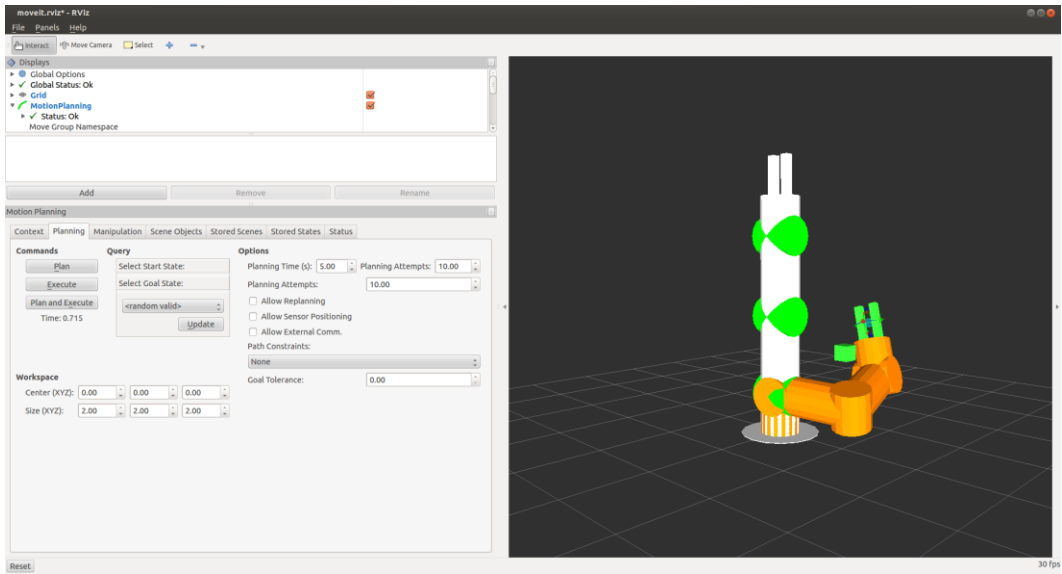


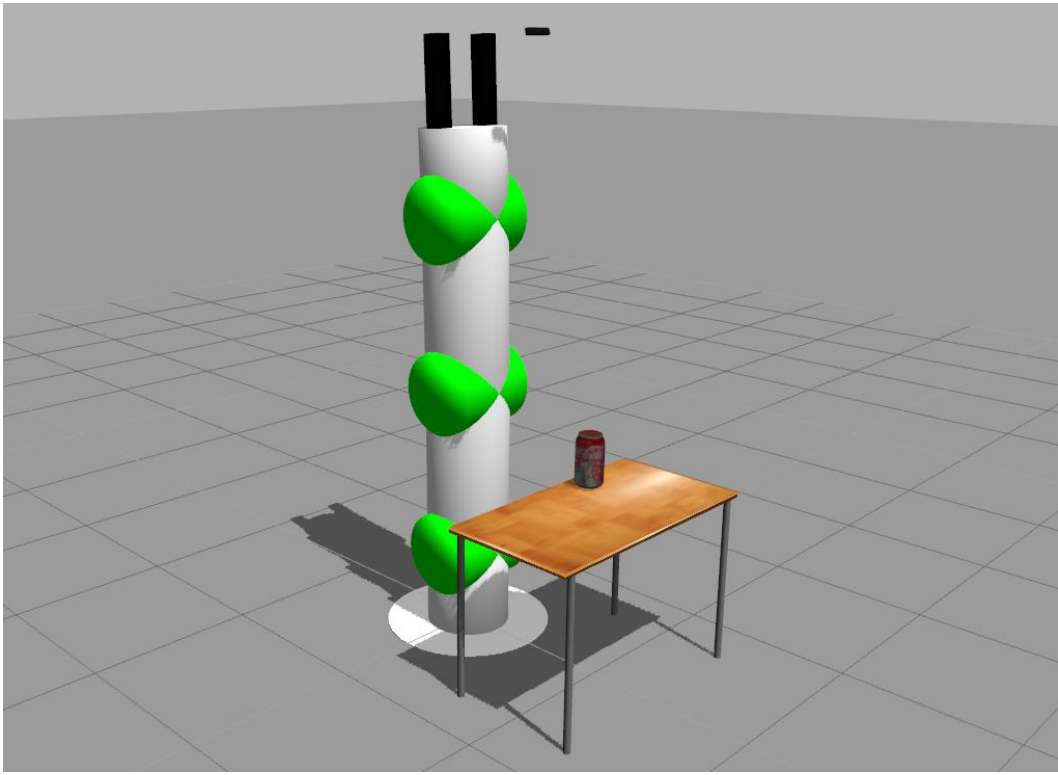


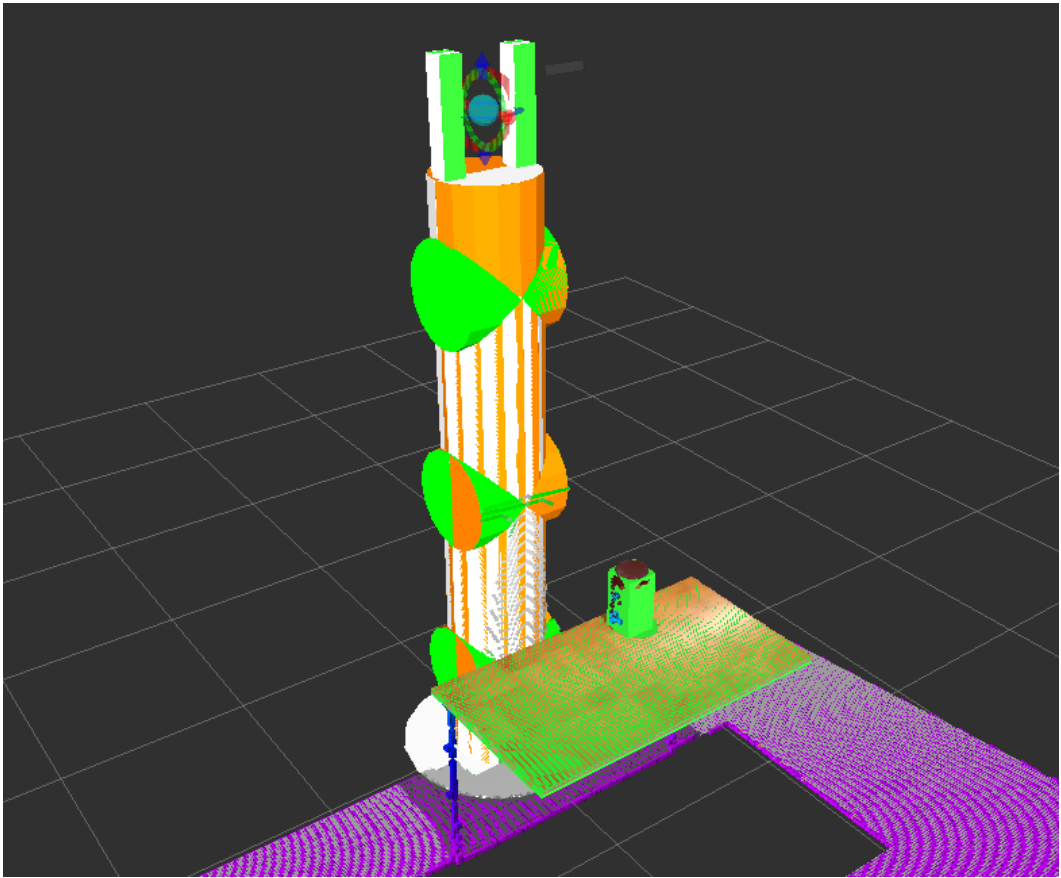


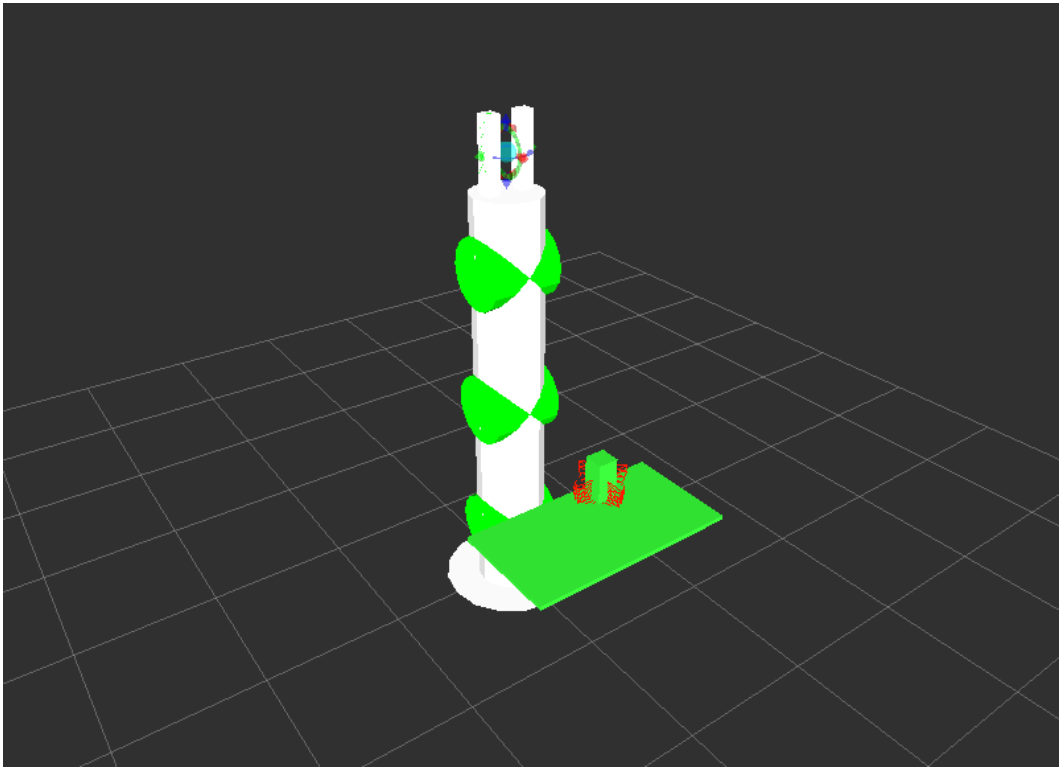
Displays

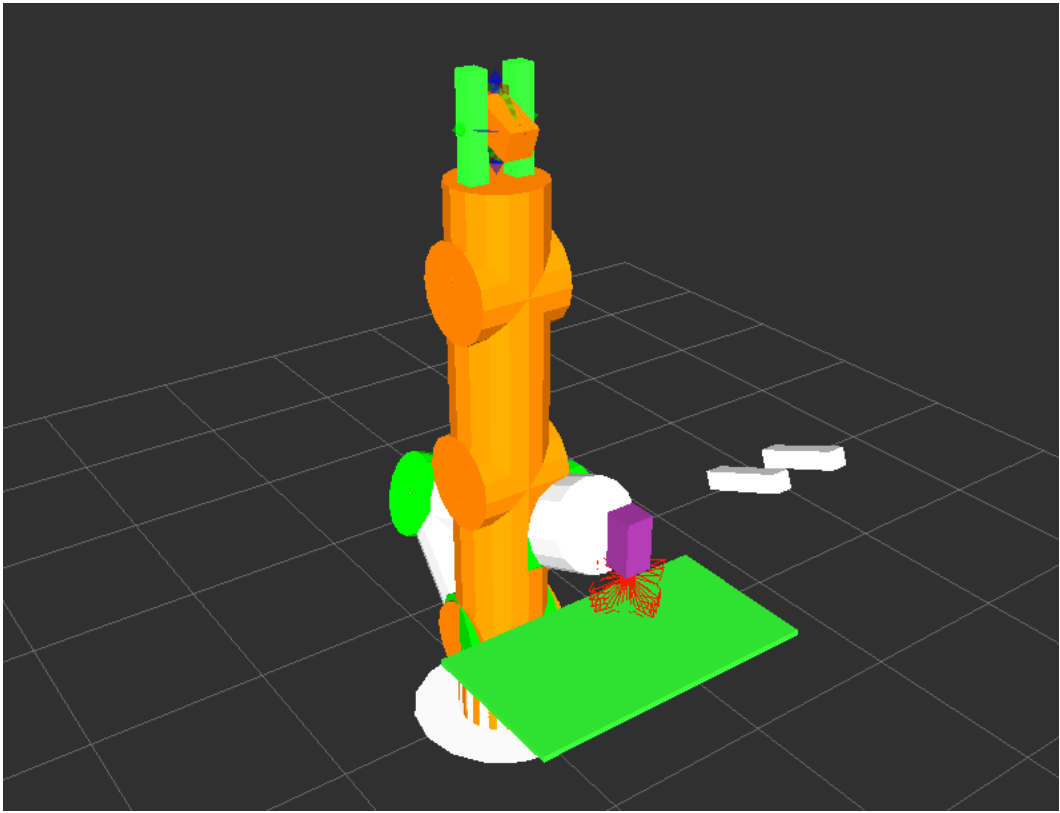
- ▶ Global Options
- ▶ Global Status: Ok
- ▶ Grid
- ▼ MotionPlanning
 - ▶ Status: Ok
 - Move Group Namespace
 - Robot Description `robot_description`
 - Planning Scene Topic `/move_group/monitored_plan...`
 - ▶ Scene Geometry
 - ▼ Scene Robot
 - Show Robot Visual
 - Show Robot Collision
 - Robot Alpha `0.5`
 - Attached Body Color `150; 50; 150`
 - ▶ Links
 - ▼ Planning Request
 - Planning Group `arm`
 - Show Workspace
 - Query Start State
 - Query Goal State
 - Interactive Marker Size `0`
 - Start State Color `0; 255; 0`
 - Start State Alpha `1`
 - Goal State Color `255; 128; 0`
 - Goal State Alpha `1`
 - Colliding Link Color `255; 0; 0`
 - Joint Violation Color `255; 0; 255`
 - ▼ Planning Metrics
 - Show Weight Limit
 - Show Manipulability Index
 - Show Manipulability
 - Show Joint Torques
 - Payload `1`
 - TextHeight `0.08`
 - ▼ Planned Path
 - Trajectory Topic `/move_group/display_planned...`
 - Show Robot Visual
 - Show Robot Collision
 - Robot Alpha `0.5`
 - State Display Time `0.05 s`
 - Loop Animation
 - Show Trail
 - ▶ Links

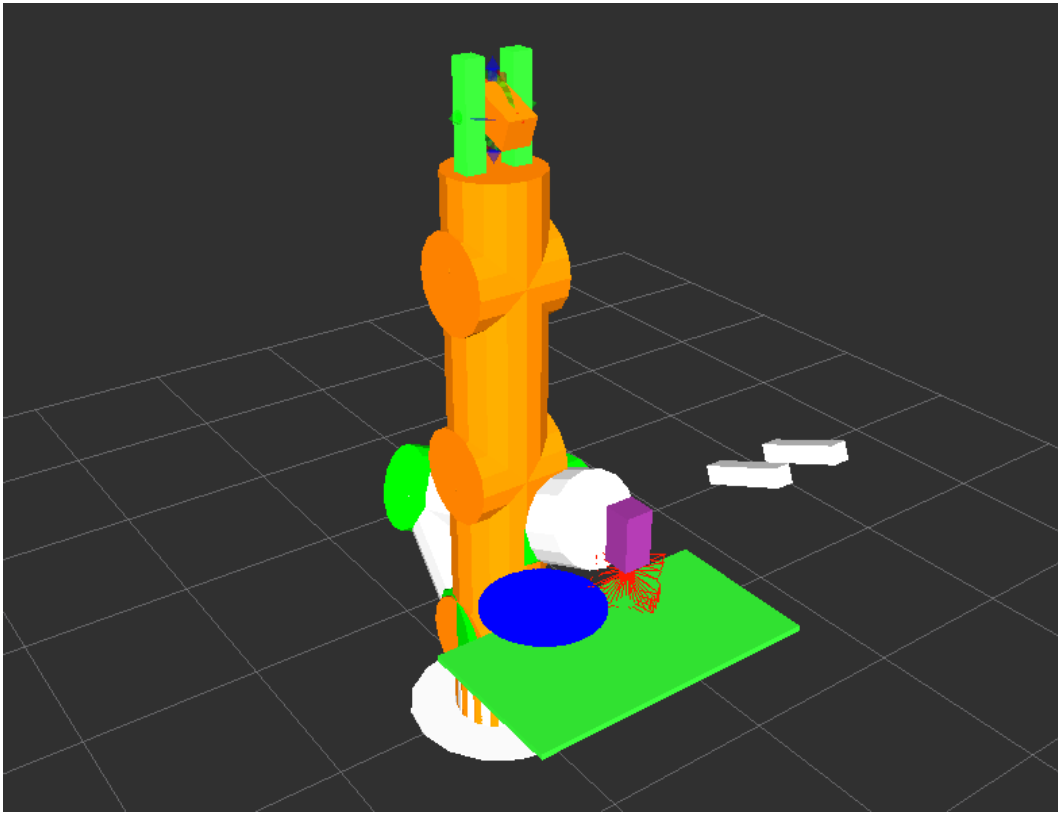


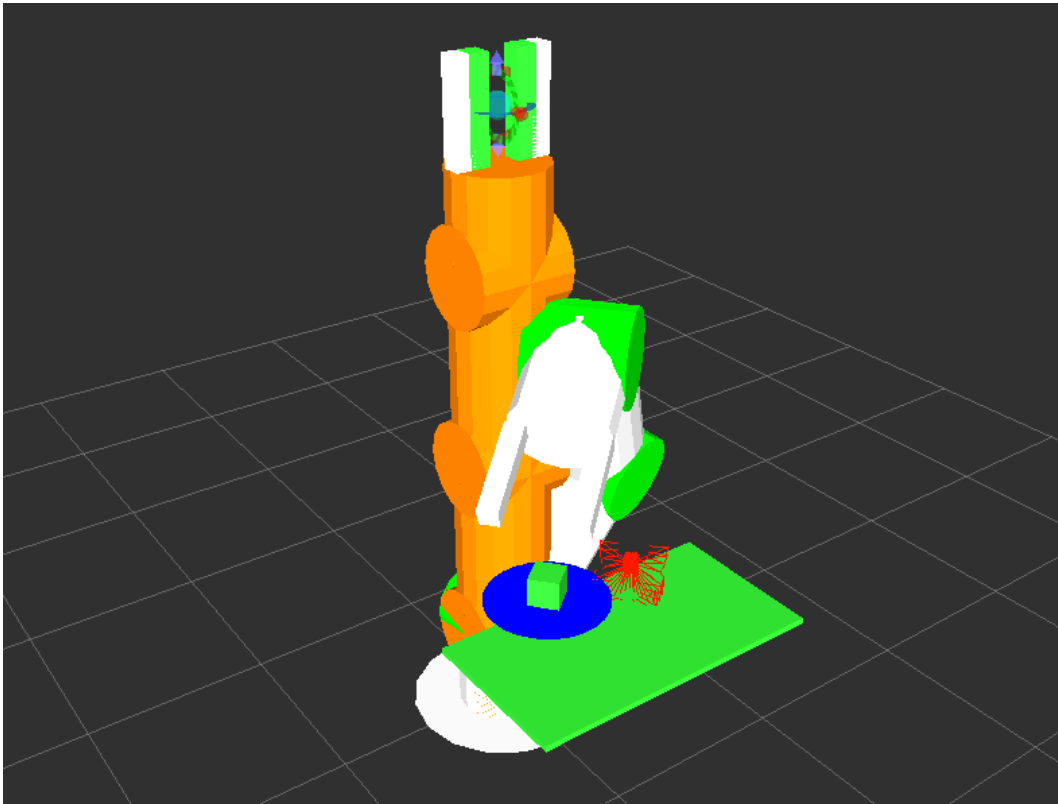


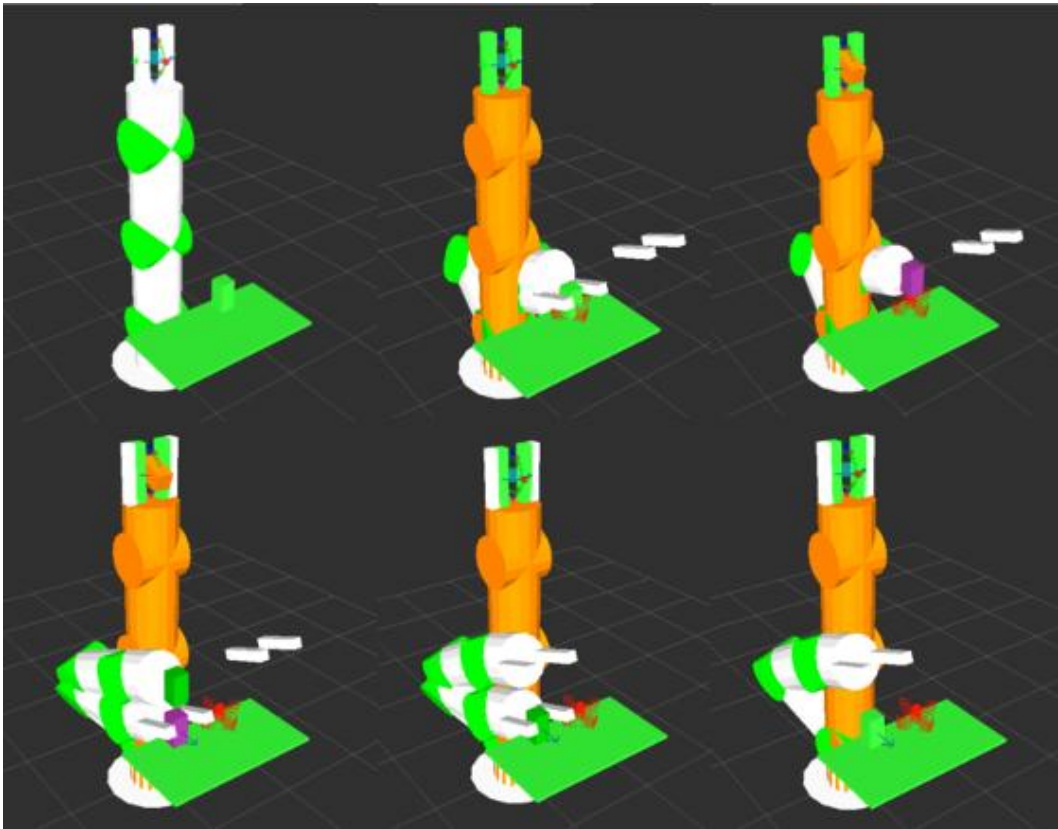












Chapter 8: Using Sensors and Actuators with ROS



```
header:  
  seq: 33  
  stamp:  
    secs: 1480289803  
    nsecs: 599782892  
  frame_id: ''  
axes: [-0.0, -0.2219386249780655, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0]  
buttons: [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
```

```
std_msgs/Header header
  uint32 seq
  time stamp
  string frame_id
float32[] axes
int32[] buttons
```

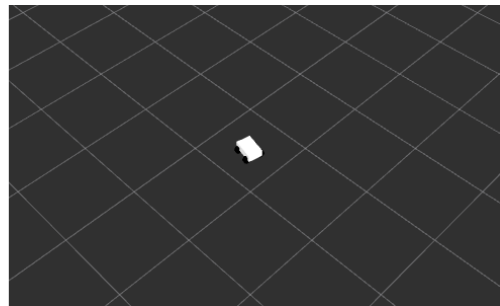
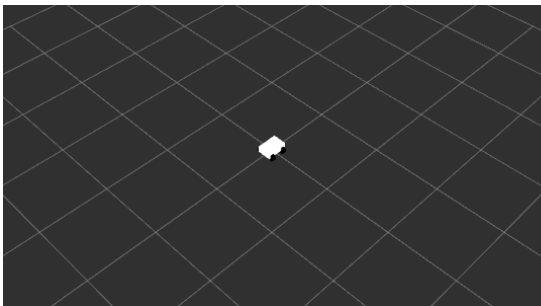
```
-----
Node [/odom]
Publications:
* /odom [nav_msgs/Odometry]
* /rosout [rosgraph_msgs/Log]
* /tf [tf2_msgs/TFMessage]

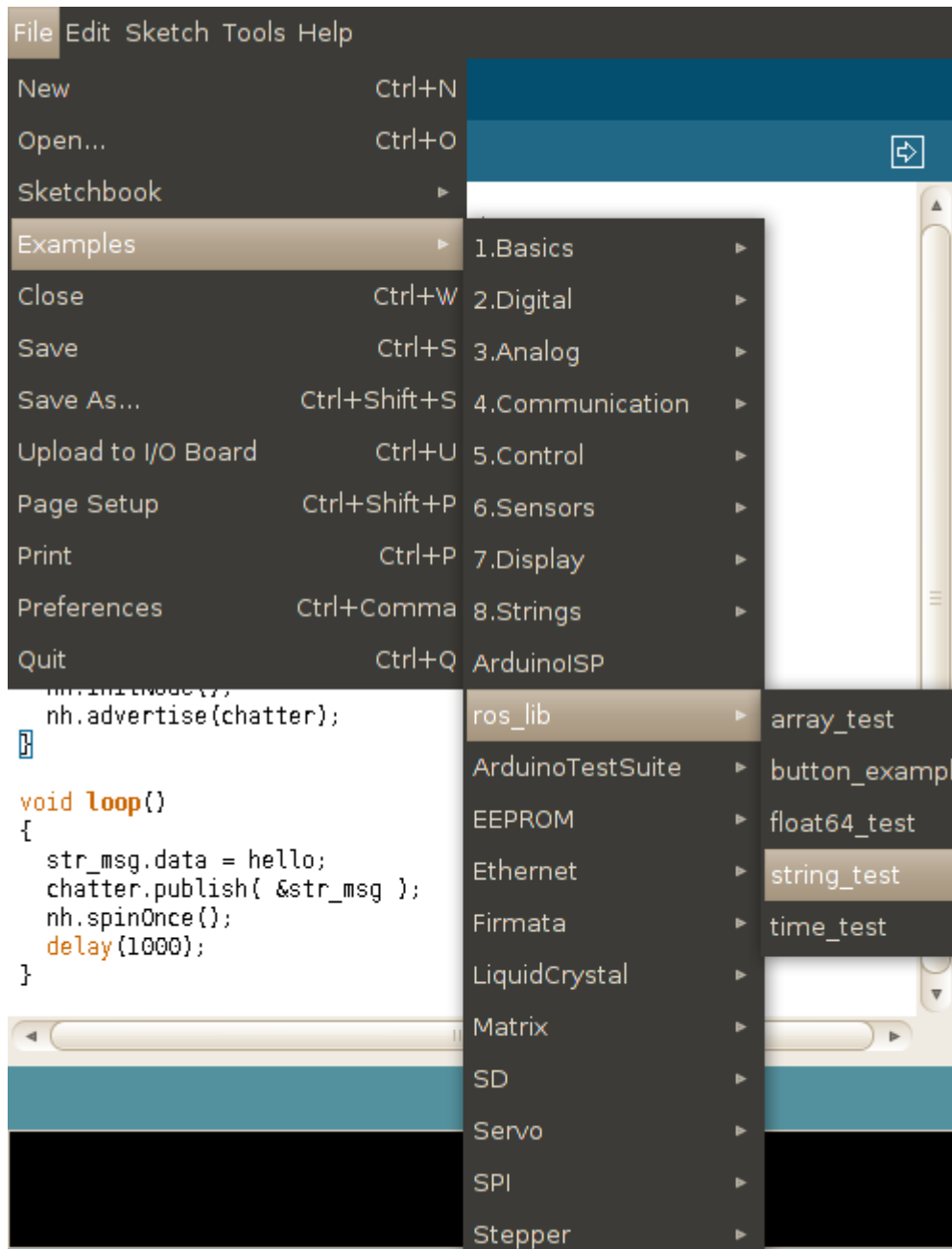
Subscriptions:
* /cmd_vel [unknown type]

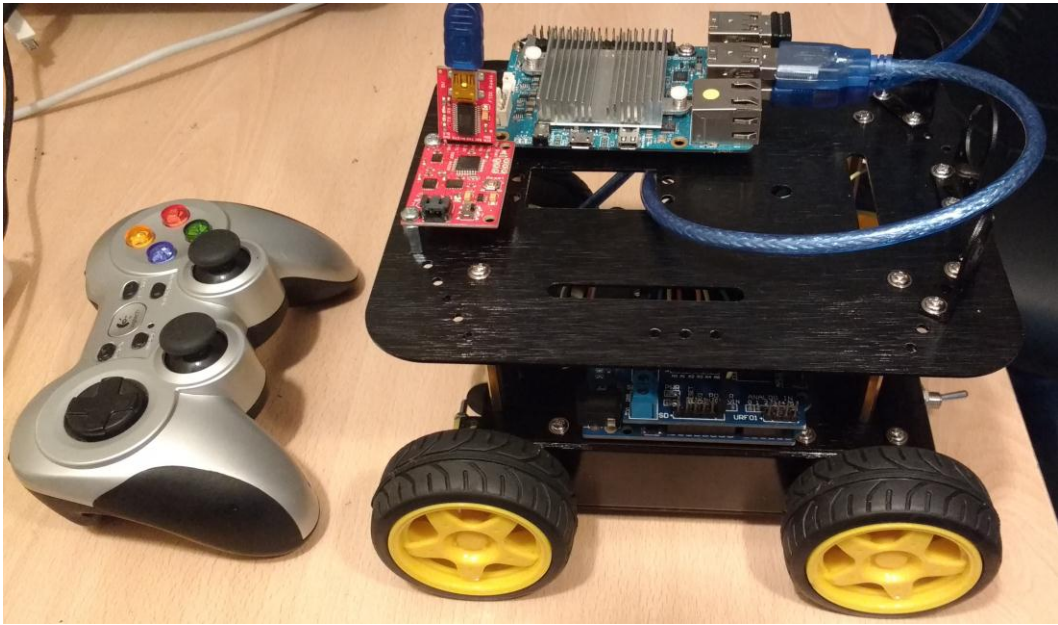
Services:
* /odom/get_loggers
* /odom/set_logger_level

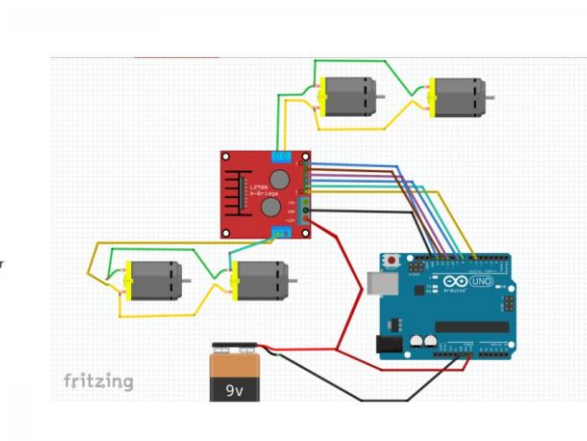
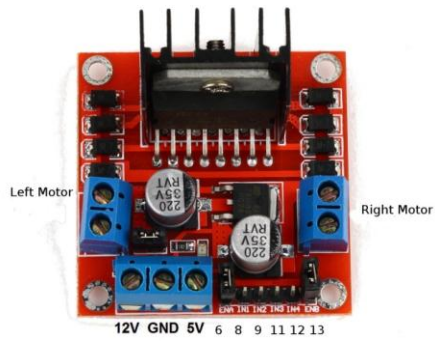
contacting node http://daneel:35582/ ...
Pid: 30375
Connections:
* topic: /rosout
  * to: /rosout
  * direction: outbound
  * transport: TCPROS
```

```
geometry_msgs/Vector3 linear
float64 x
float64 y
float64 z
geometry_msgs/Vector3 angular
float64 x
float64 y
float64 z
```







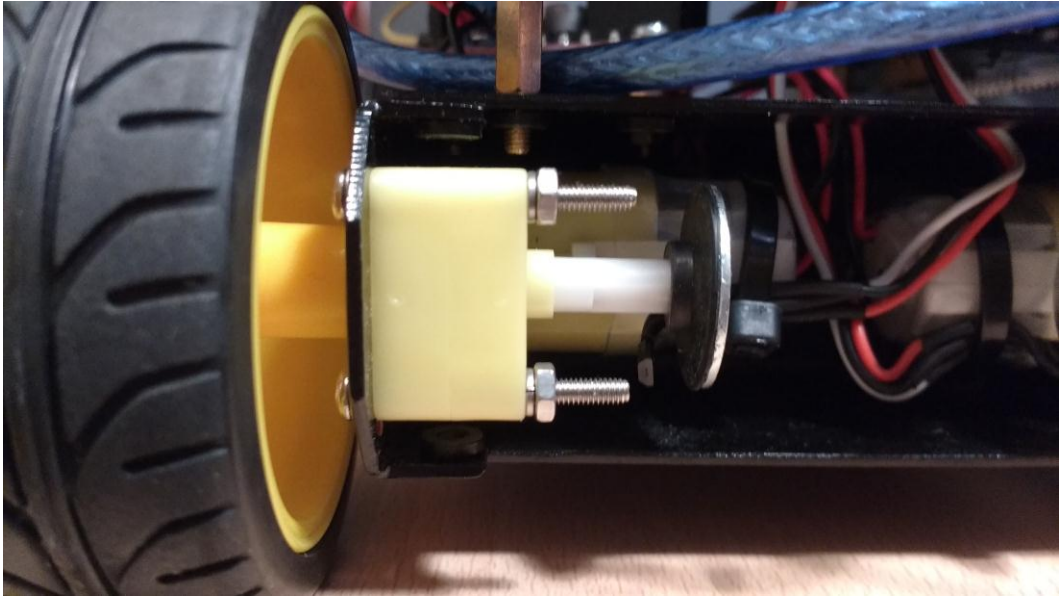


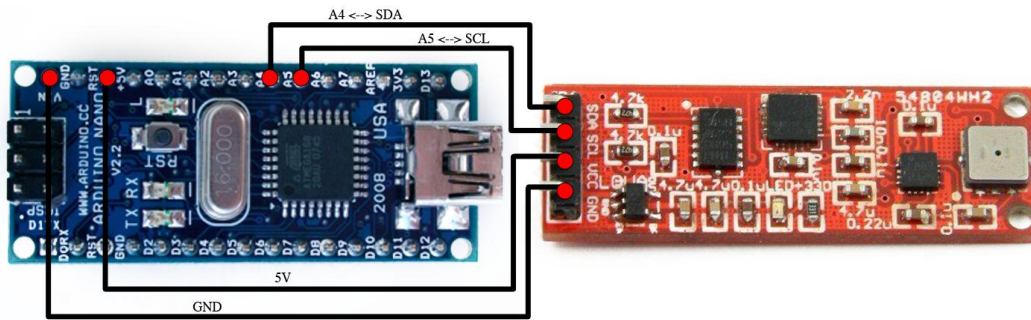
```
/cmd_left_wheel  
/cmd_right_wheel  
/diagnostics  
/left_wheel_velocity  
/right_wheel_velocity  
/rosout  
/rosout_agg
```



```
subscribed to [/left_wheel_velocity]
average rate: 5.008
  min: 0.198s max: 0.201s std dev: 0.00127s window: 5
average rate: 5.004
  min: 0.197s max: 0.201s std dev: 0.00146s window: 10
^Coverage rate: 5.006
  min: 0.197s max: 0.201s std dev: 0.00156s window: 14
luis@daneel:~$ rostopic hz /right_wheel_velocity
subscribed to [/right_wheel_velocity]
average rate: 5.007
  min: 0.198s max: 0.201s std dev: 0.00095s window: 5
average rate: 5.011
  min: 0.198s max: 0.201s std dev: 0.00083s window: 10
average rate: 5.009
  min: 0.198s max: 0.201s std dev: 0.00078s window: 15
^Coverage rate: 5.007
  min: 0.198s max: 0.201s std dev: 0.00081s window: 16
```

```
linear:
  x: 0.046875
  y: 0.0
  z: 0.0
angular:
  x: 0.0
  y: 0.0
  z: 0.9375
---
linear:
  x: 0.046875
  y: 0.0
  z: 0.0
angular:
  x: 0.0
  y: 0.0
  z: 0.9375
---
linear:
  x: 0.046875
  y: 0.0
  z: 0.0
angular:
  x: 0.0
  y: 0.0
  z: 0.9375
---
```





9DOF Razor IMU Main Screen

Press 'a' to align

9DOF Razor IMU Roll, Pitch, Yaw

Linear Acceleration x / y / z (m/s²)

Roll (degrees / radians) Pitch (degrees / radians)

Yaw (degrees / radians)

NW N NE
W ↑ E
SW S SE

Angular Velocity x / y / z (rad/s)

9DOF Razor IMU Main Screen

9DOF Razor IMU Roll, Pitch, Yaw

Linear Acceleration x / y / z (m/s²)
4.75 / 3.06 / 7.84

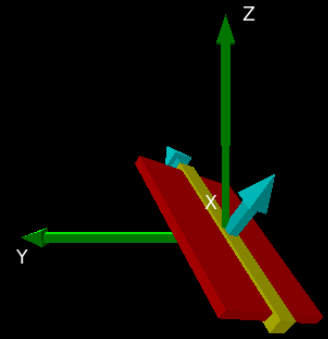
Roll (degrees / radians)
22.19 / 0.39

Pitch (degrees / radians)
-30.9 / -0.54

Yaw (degrees / radians)
30.17 / 0.53

Angular Velocity x / y / z (rad/s)
-0.0 / -0.09 / 0.01

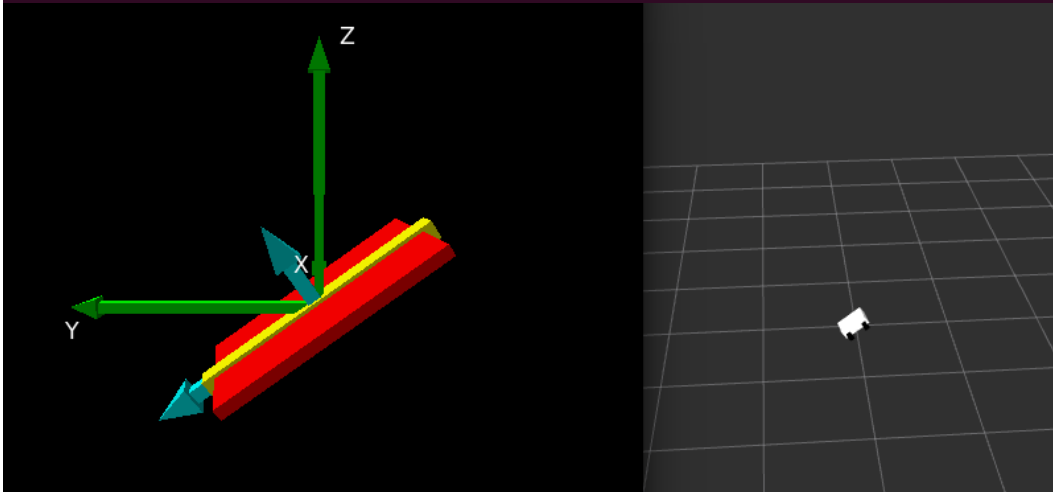
Press 'a' to align



```
212 # /home/luis/devel/catkin_ws/src/razor_imu_9dof/launch/razor-pub-and-display.launch http:
213 #
214 # magn_ellipsoid_center:[0.0000,0.0000,0.0000]
215 # magn_ellipsoid_transform:[[0.0000000,0.0000000,0.0000000],[0.0000000,0.0000000,0
216 # .0000000],[0.0000000,0.0000000,0.0000000]]
217
218 # gyro_average_offset_x:0.00
219 # gyro_average_offset_y:0.00
220 # gyro_average_offset_z:0.00
221 #
222 [INFO] [WallTime: 1470778293.233547] Flushing first 200 IMU entries...
223 [INFO] [WallTime: 1470778297.350000] Publishing IMU data...
224
```

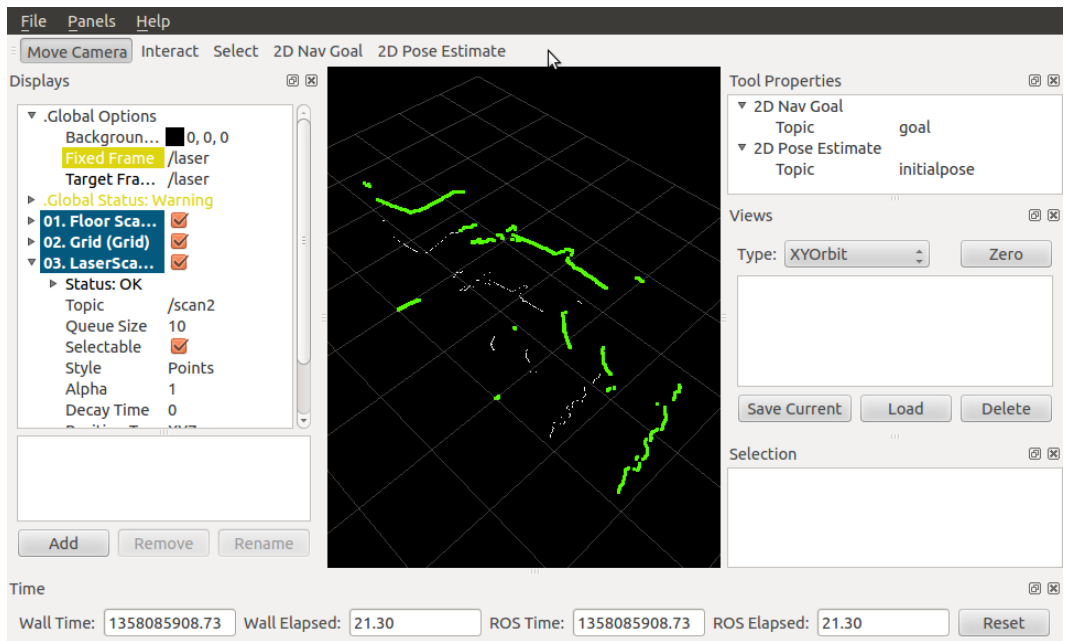
```
std_msgs/Header header
  uint32 seq
  time stamp
  string frame_id
geometry_msgs/Quaternion orientation
  float64 x
  float64 y
  float64 z
  float64 w
float64[9] orientation_covariance
geometry_msgs/Vector3 angular_velocity
  float64 x
  float64 y
  float64 z
float64[9] angular_velocity_covariance
geometry_msgs/Vector3 linear_acceleration
  float64 x
  float64 y
  float64 z
float64[9] linear_acceleration_covariance
```

```
header:
  seq: 43264
  stamp:
    secs: 1480621387
    nsecs: 926049947
  frame_id: base_imu_link
orientation:
  x: -0.664401936806
  y: 0.459286679427
  z: -0.562455021343
  w: 0.176833711254
orientation_covariance: [0.0025, 0.0, 0.0, 0.0, 0.0025, 0.0, 0.0, 0.0, 0.0025]
angular_velocity:
  x: -0.02
  y: -0.04
  z: -0.0
angular_velocity_covariance: [0.02, 0.0, 0.0, 0.0, 0.02, 0.0, 0.0, 0.0, 0.02]
linear_acceleration:
  x: 5.8836
  y: -7.60960921875
  z: -2.98087078125
linear_acceleration_covariance: [0.04, 0.0, 0.0, 0.0, 0.04, 0.0, 0.0, 0.0, 0.04]
---
```

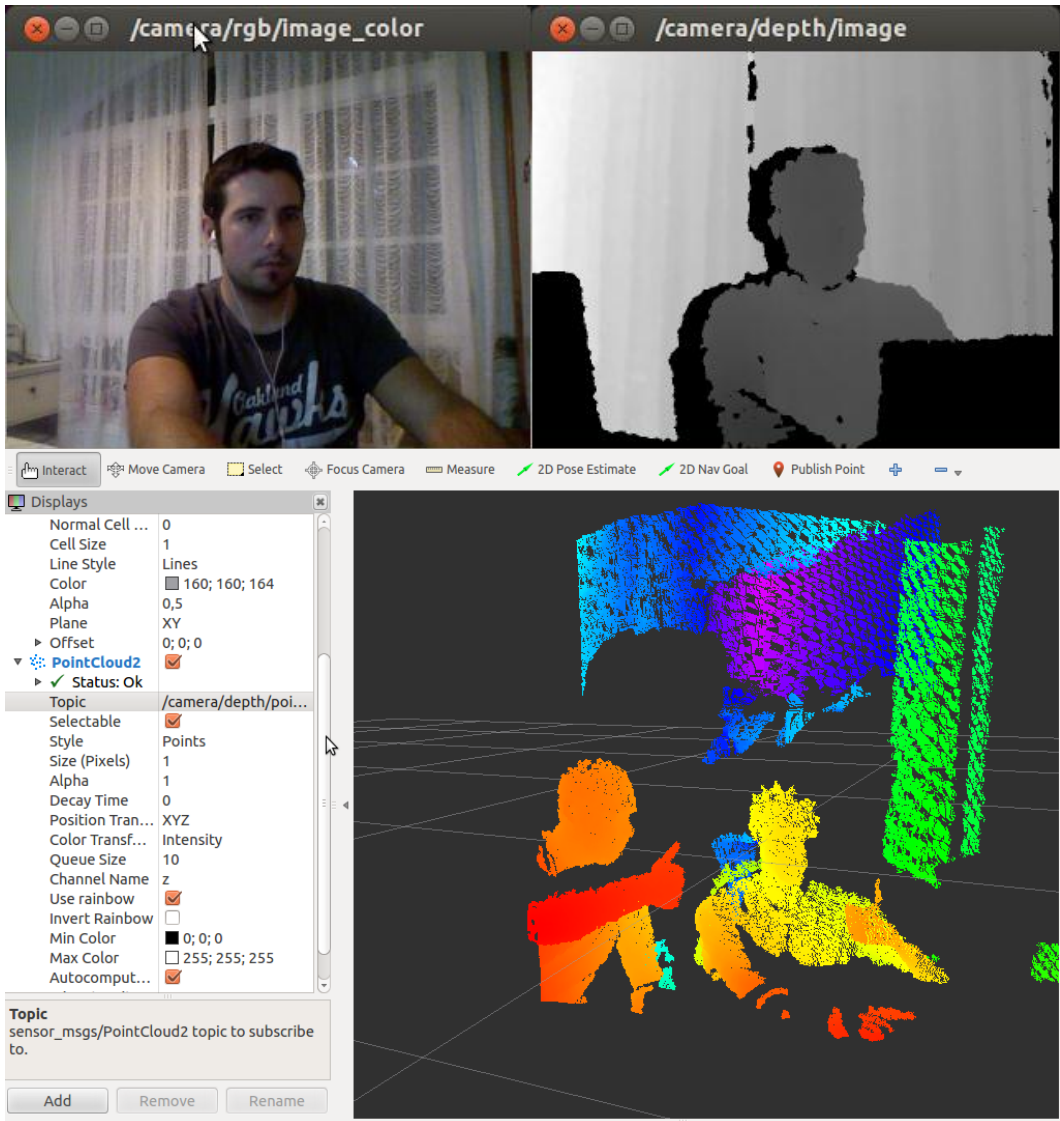


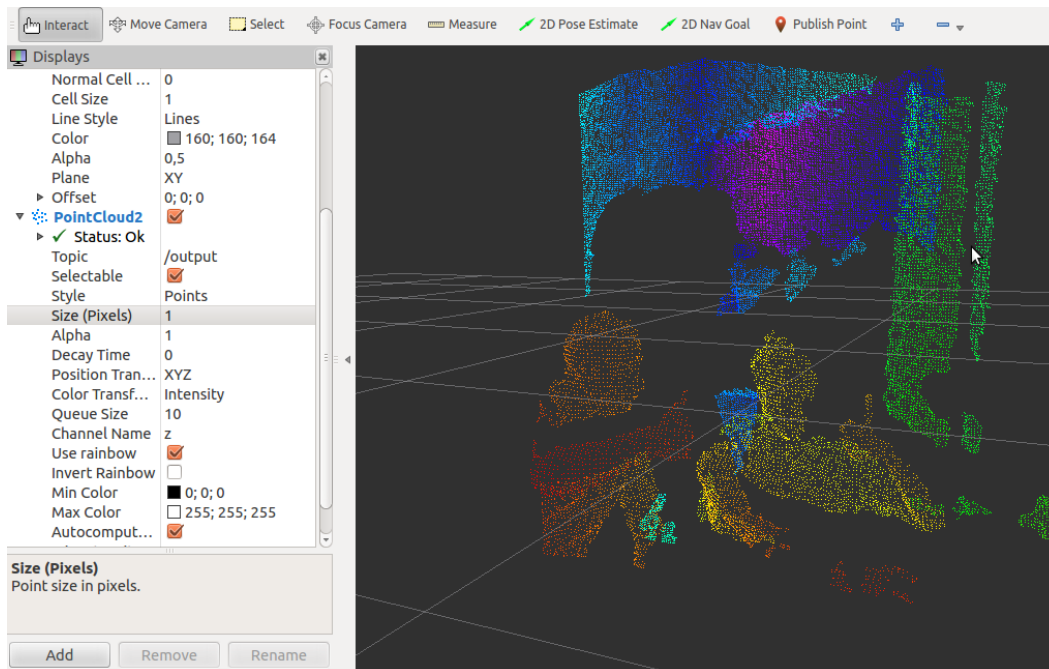


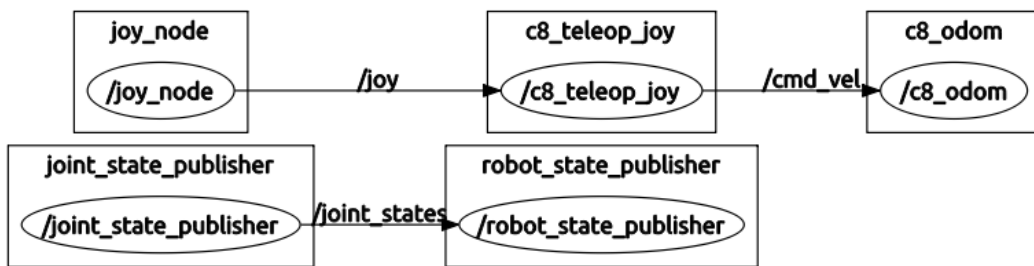




KINECT™
for  XBOX 360.







File Panels Help

Move Camera Interact Select 2D Nav Goal 2D Pose Estimate

Displays

- Global Options
 - Background... 0, 0, 0
 - Fixed Frame /laser
 - Target Fra... /laser
 - Global Status: Warning
 - 01. Floor Sca...
 - 02. Grid (Grid)

Add Remove Rename

Tool Properties

- 2D Nav Goal
 - Topic goal
- 2D Pose Estimate
 - Topic initialpose

Views

Type: XYOrbit Zero

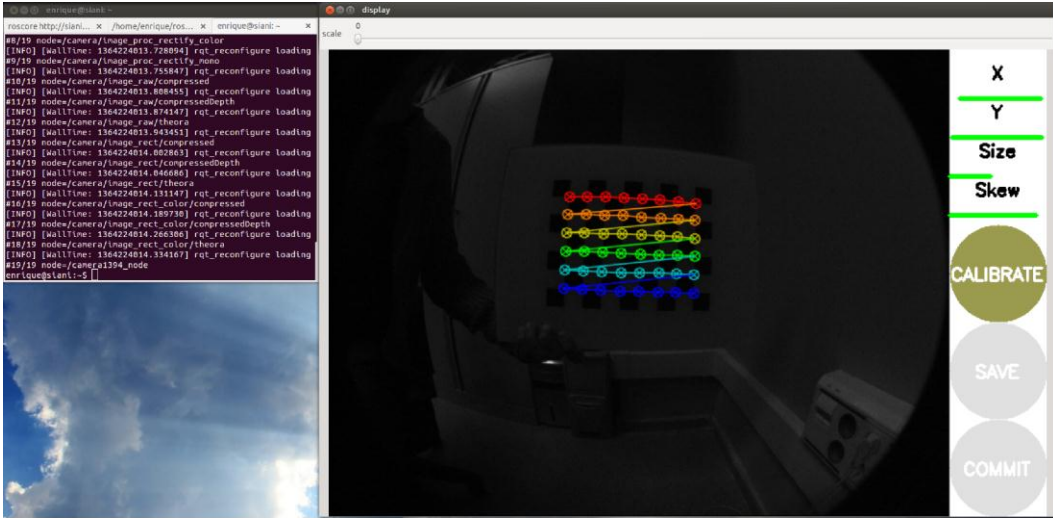
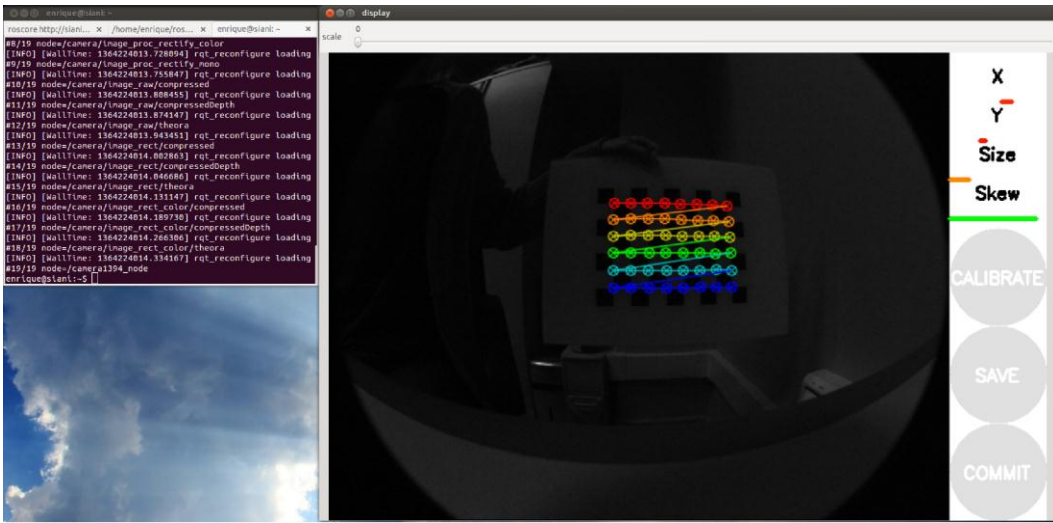
Save Current Load Delete

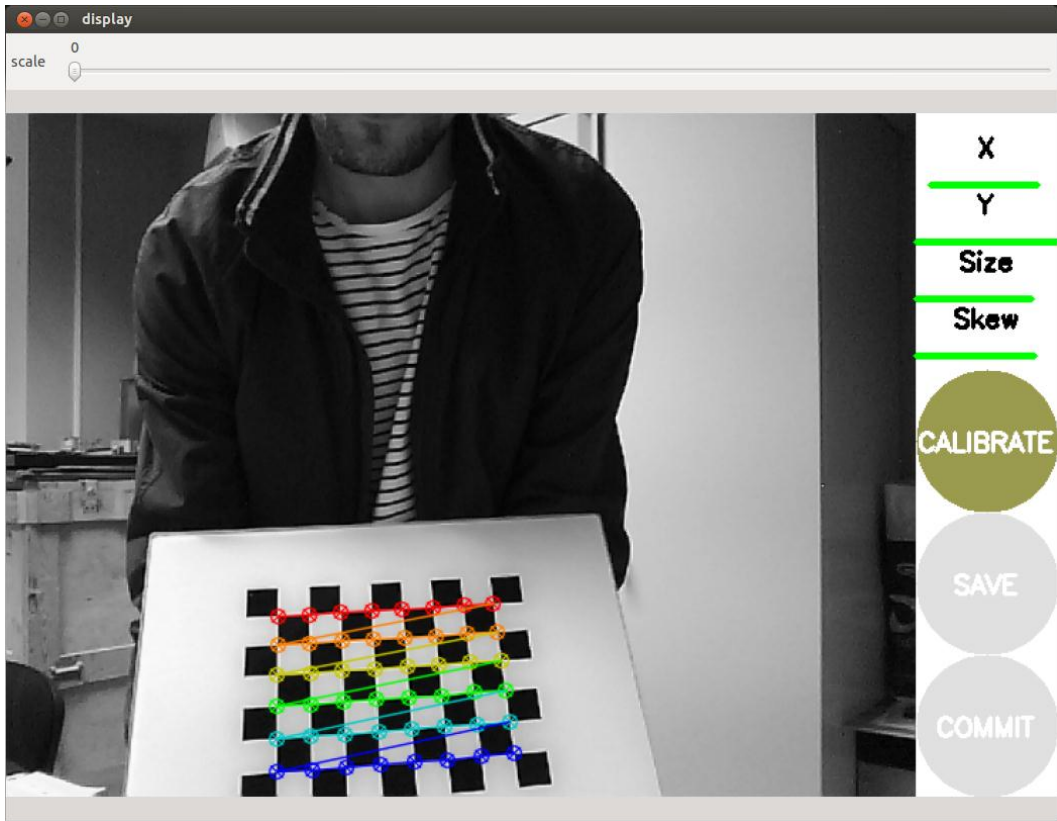
Selection

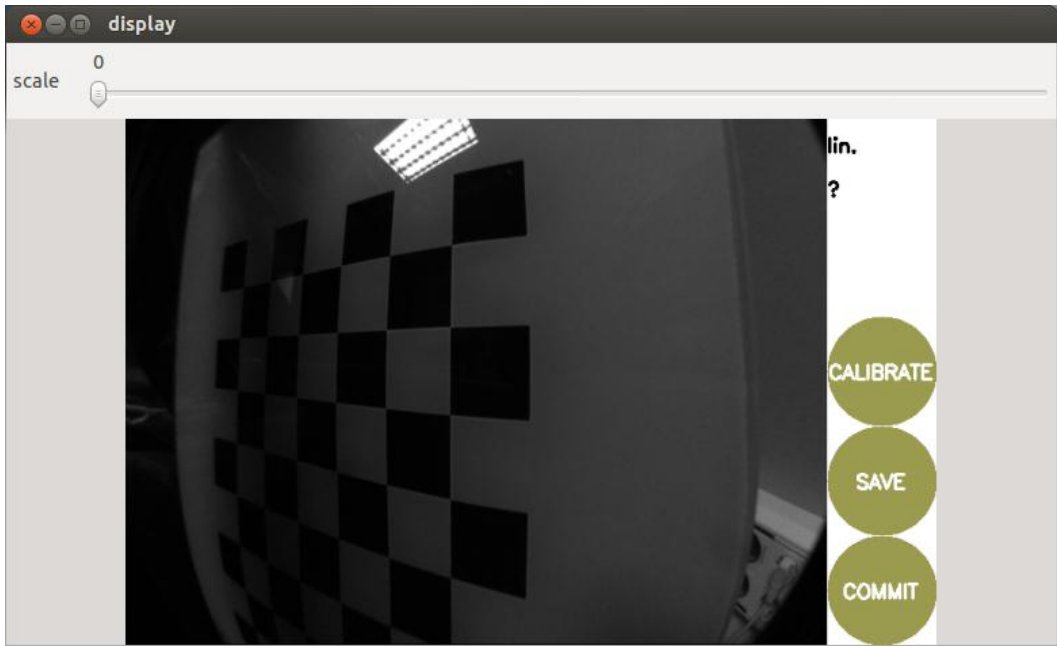
Time

Wall Time: 1358077273.25 Wall Elapsed: 102.78 ROS Time: 1358077273.25 ROS Elapsed: 102.78 Reset







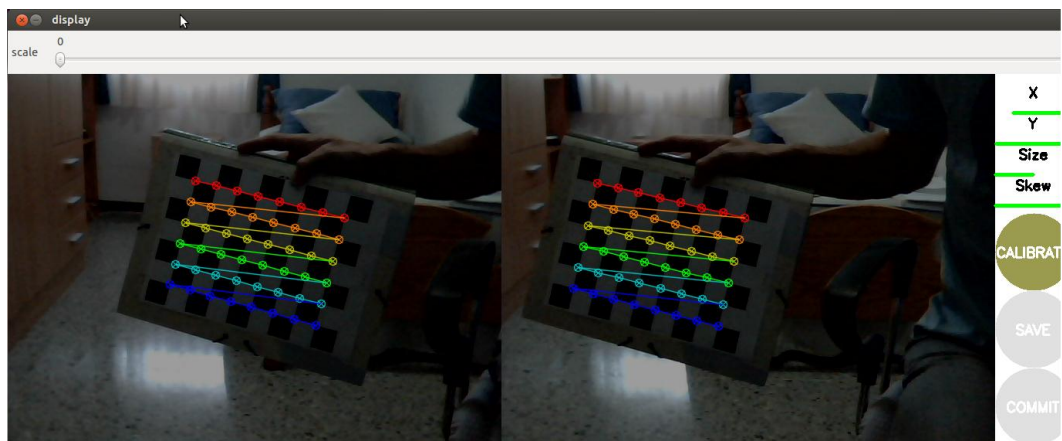


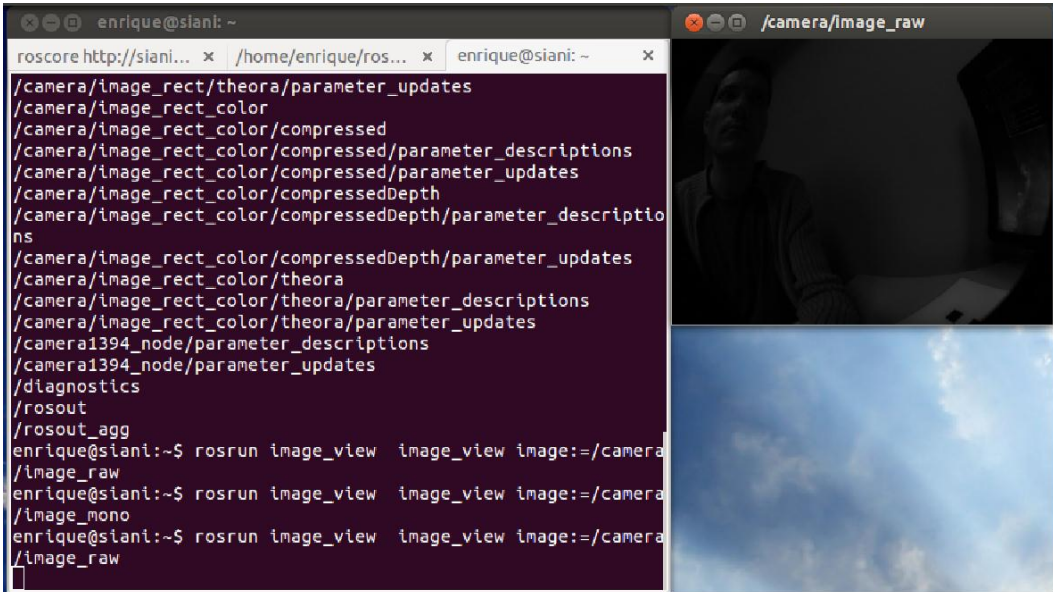


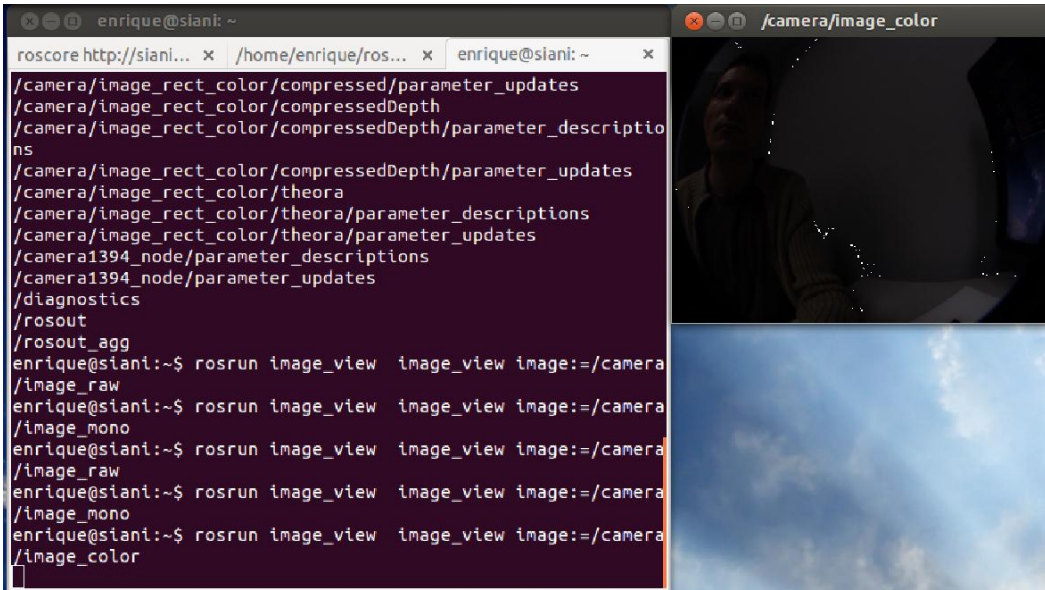
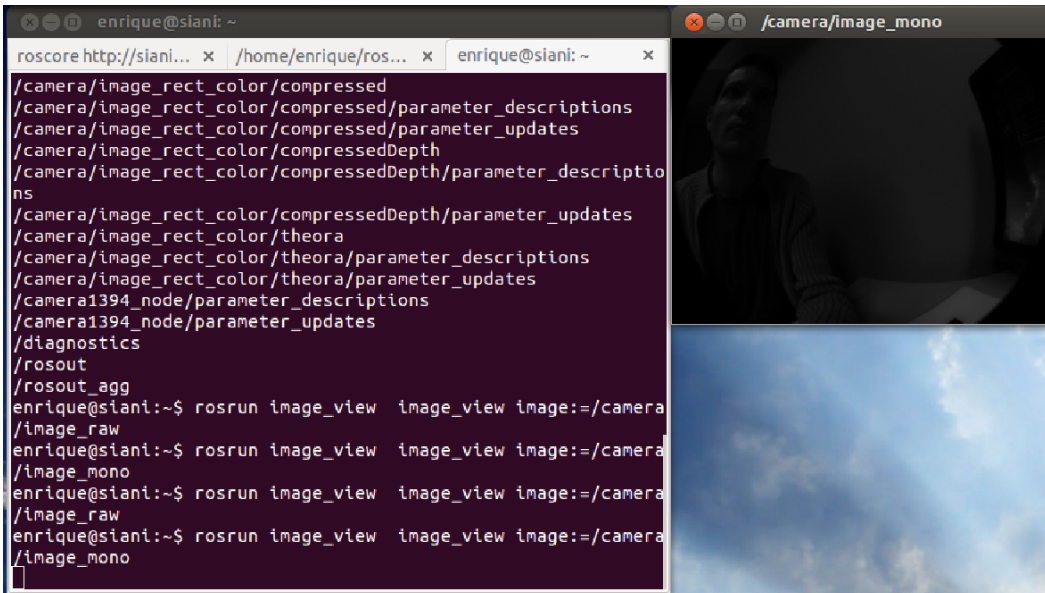
```
ioctl: VIDIOC_ENUM_FMT
Index : 0
Type : Video Capture
Pixel Format: 'YUYV'
Name : YUV 4:2:2 (YUYV)

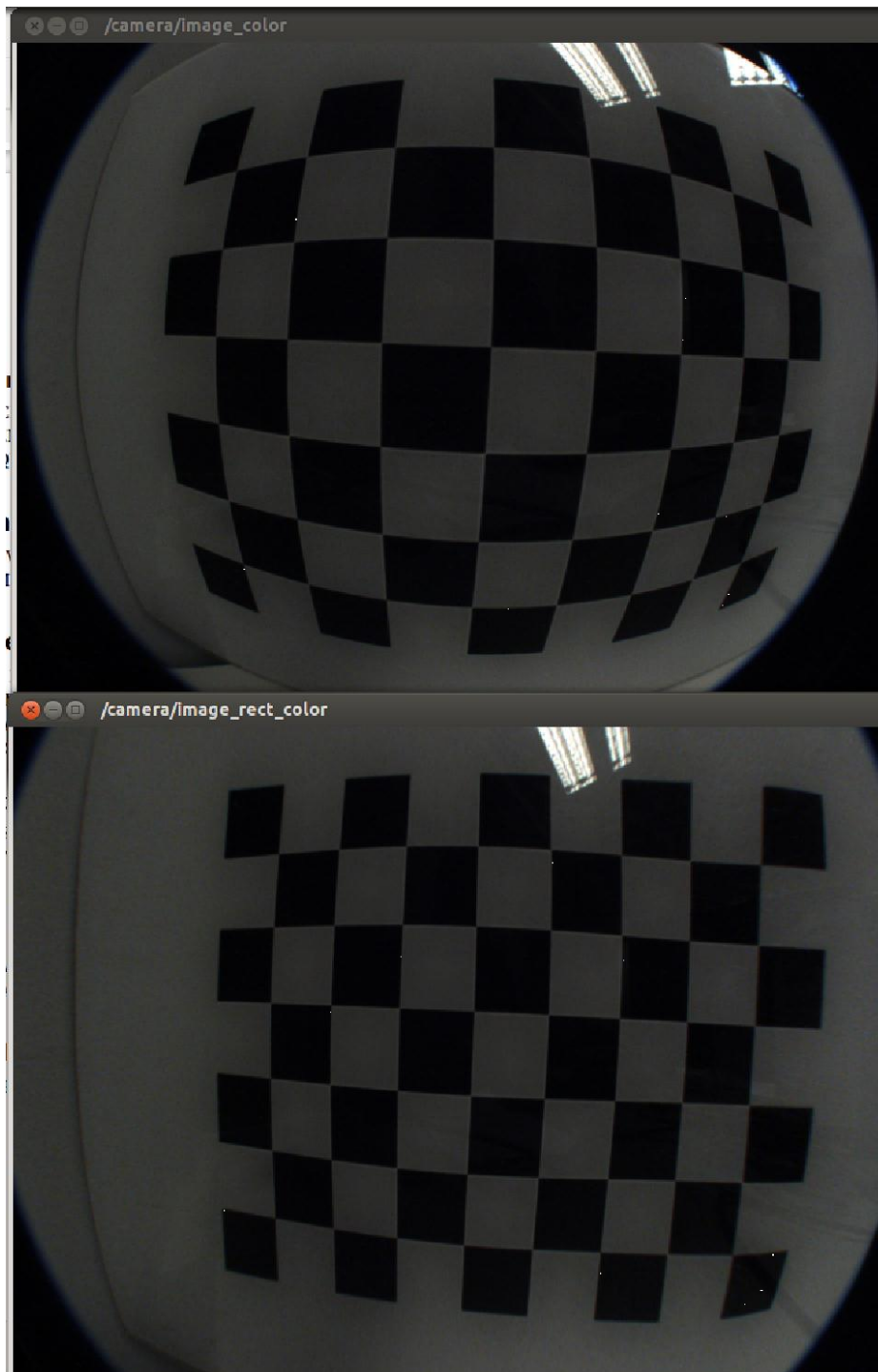
Index : 1
Type : Video Capture
Pixel Format: 'MJPG' (compressed)
Name : MJPEGioctl: VIDIOC_ENUM_FMT
Index : 0
Type : Video Capture
Pixel Format: 'YUYV'
Name : YUV 4:2:2 (YUYV)

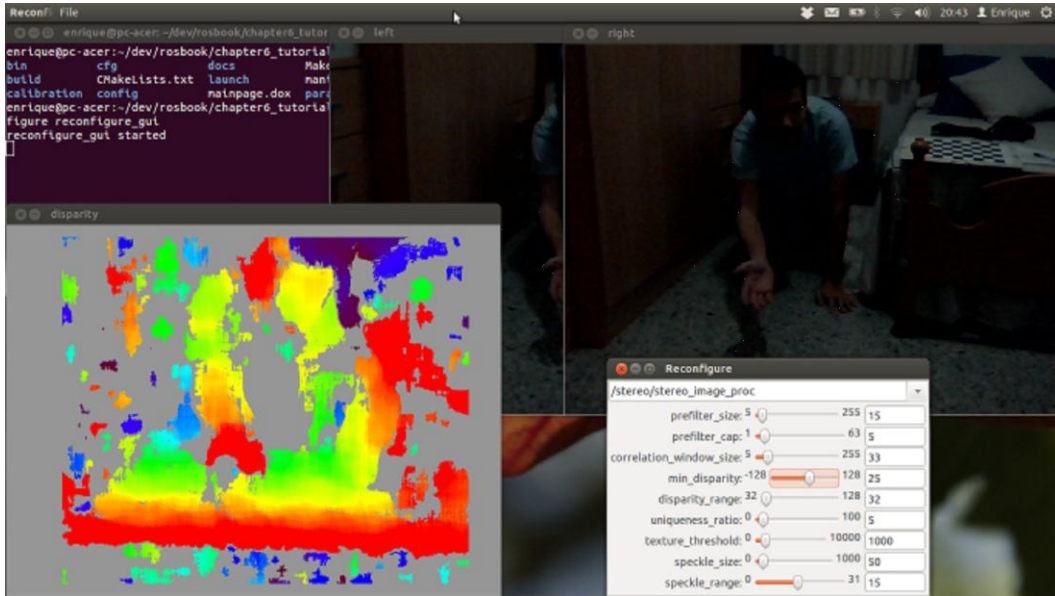
Index : 1
Type : Video Capture
Pixel Format: 'MJPG' (compressed)
```





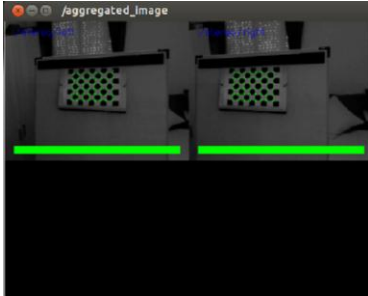












```

/home/enrique/dev/rosbook/chapter6_tutorials/launch/...
/home/enrique/ros/stacks/camera_pose/camera_pose_c...
[INFO] [WallTime: 1365876274.168936] RMS: 0.9333076296619952
[INFO] [WallTime: 1365876274.426209] RMS: 0.9333076296619962
[INFO] [WallTime: 1365876274.783459] RMS: 0.9333076296619960
[INFO] [WallTime: 1365876275.025765] RMS: 0.9333076296619945
[INFO] [WallTime: 1365876275.348485] RMS: 0.9333076296619914
[INFO] [WallTime: 1365876275.668242] RMS: 0.9333076296619918
[INFO] [WallTime: 1365876275.955935] RMS: 0.9333076296619916
[INFO] [WallTime: 1365876276.266447] RMS: 0.9333076296619914
[INFO] [WallTime: 1365876276.591021] RMS: 0.9333076296619911
[INFO] [WallTime: 1365876276.889535] RMS: 0.9333076296619918
[INFO] [WallTime: 1365876277.163942] RMS: 0.9333076296619916
[INFO] [WallTime: 1365876277.468607] RMS: 0.9333076296619919
[INFO] [WallTime: 1365876277.763509] RMS: 0.9333076296619911
[INFO] [WallTime: 1365876278.045626] RMS: 0.9333076296619925
[INFO] [WallTime: 1365876278.322111] RMS: 0.9333076296619942
[INFO] [WallTime: 1365876278.578488] RMS: 0.9333076296619925
[INFO] [WallTime: 1365876278.874106] RMS: 0.9333076296619908

```

```

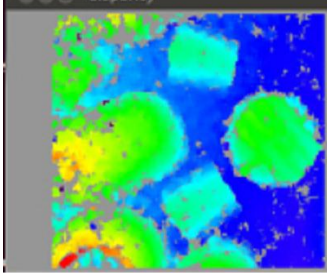
/home/enrique/dev/rosbook/chapter6_tutorials/launch/...
outlier_disp_tolerance = 5
outlier_flow_tolerance = 5
multi_stage = 1
half_resolution = 1
refinement = 1
Bucketing parameters:
max_features = 2
bucket_width = 50
bucket_height = 50
Stereo odometry parameters:
base = 0.124709
ransac_iters = 200
inlier_threshold = 1.5
reweighting = 1
notion_threshold = 5
[WARN] [1365881823.146520654, 1348572182.950380694]: Visual Odometry got lost!
[WARN] [1365881824.241613901, 1348572184.038589802]: Visual Odometry got lost!

```

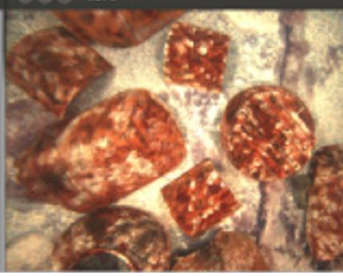
Reconfigure /stereo_down/stereo_image_p...

prefilter_size:	5	255	15
prefilter_cap:	1	63	5
correlation_window_size:	5	255	23
min_disparity:	-128	128	77
disparity_range:	32	128	48
uniqueness_ratio:	0	100	5
texture_threshold:	0	10000	500
speckle_size:	0	1000	100
speckle_range:	0	31	5

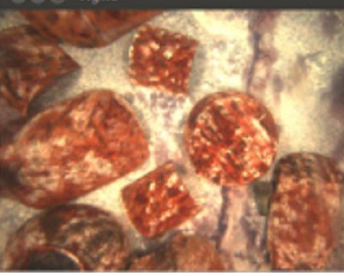
disparity

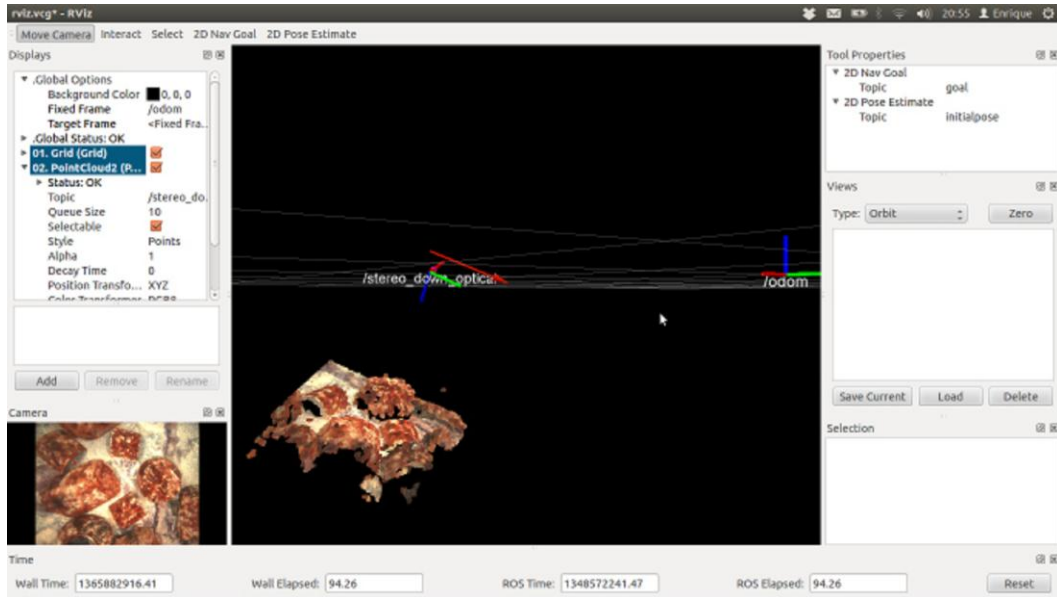
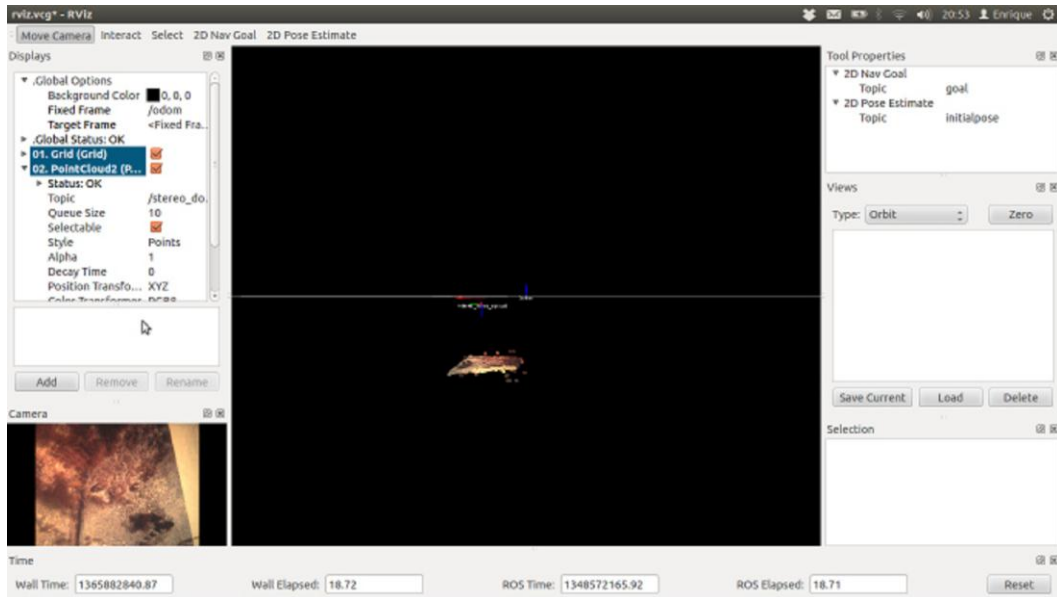


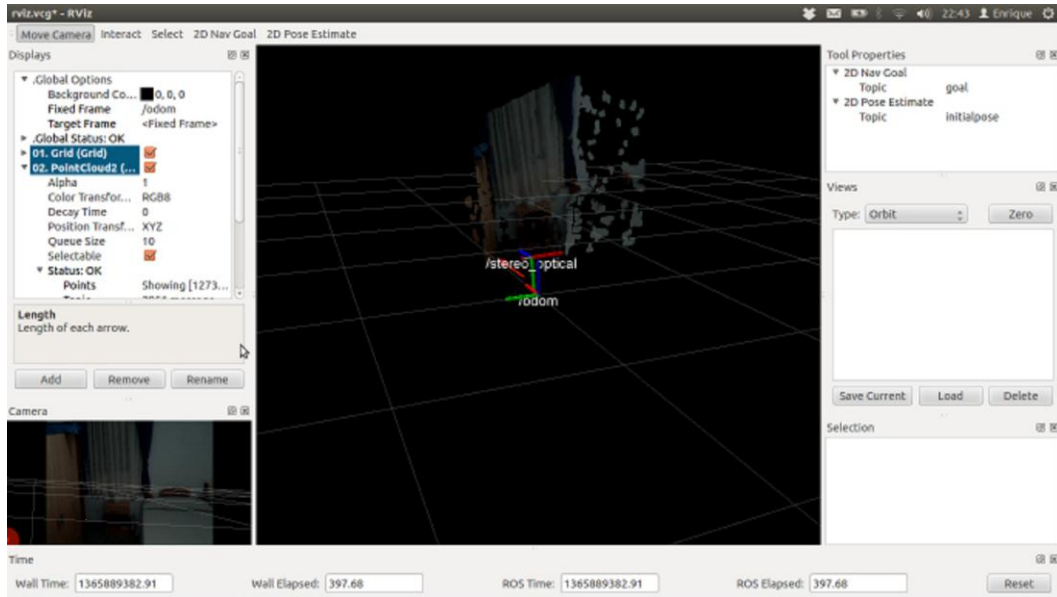
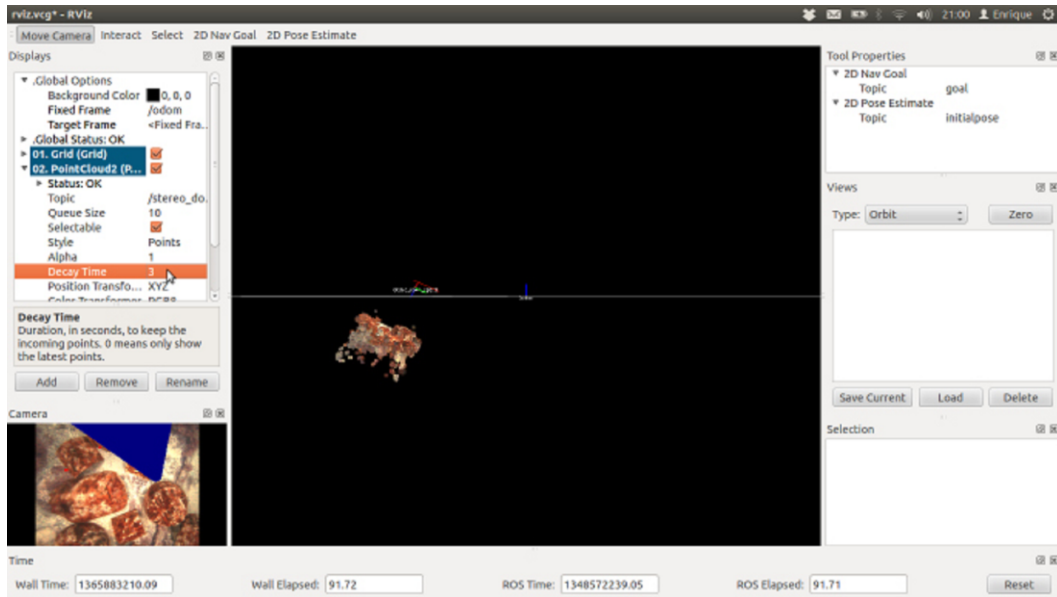
left

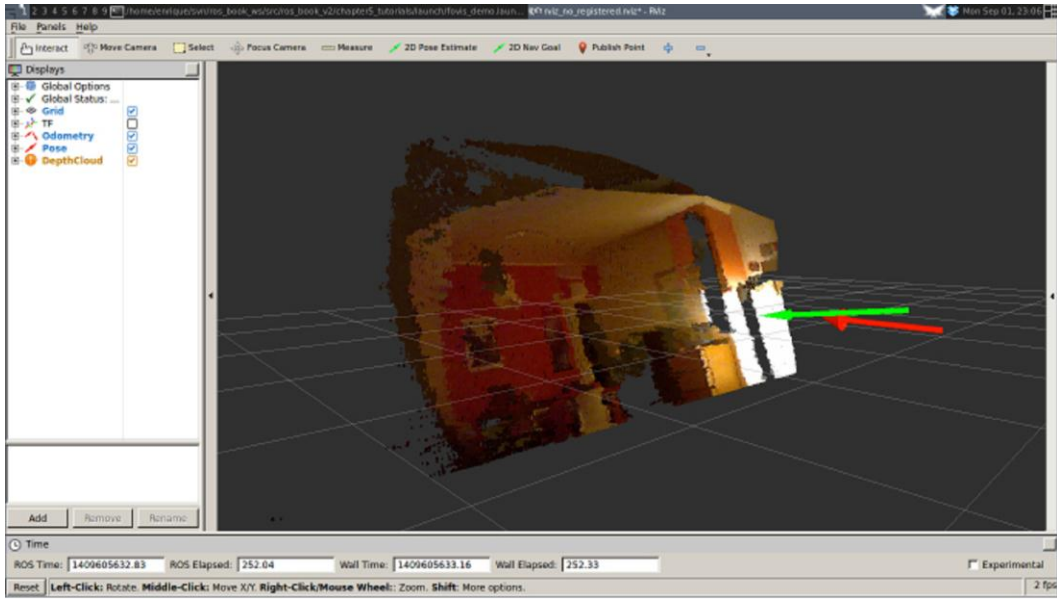
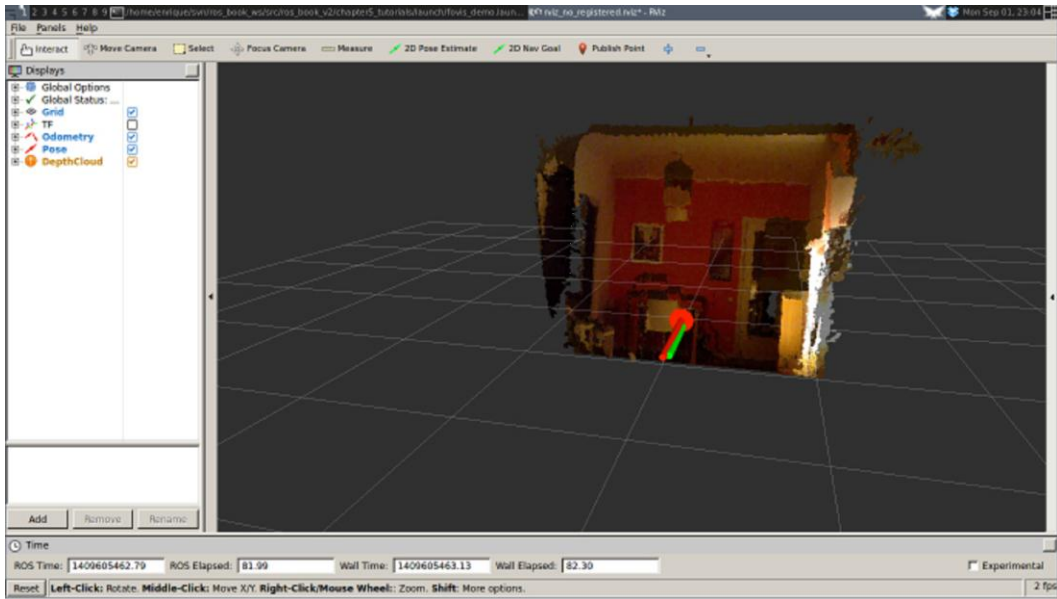


right





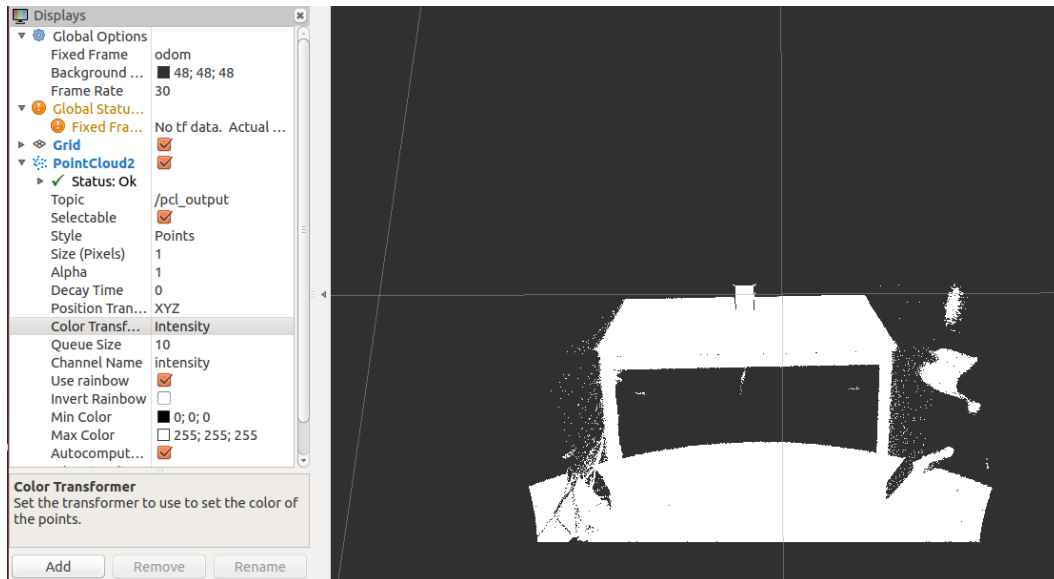
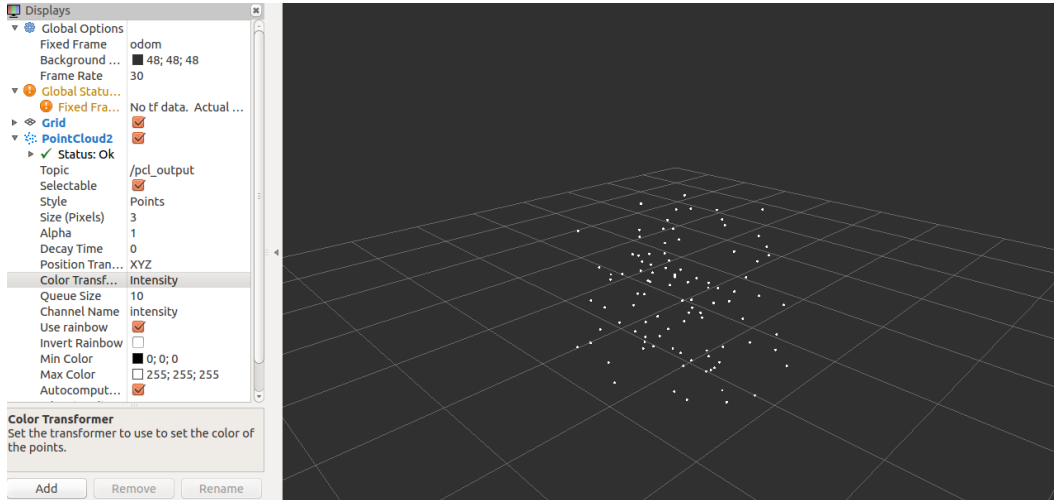


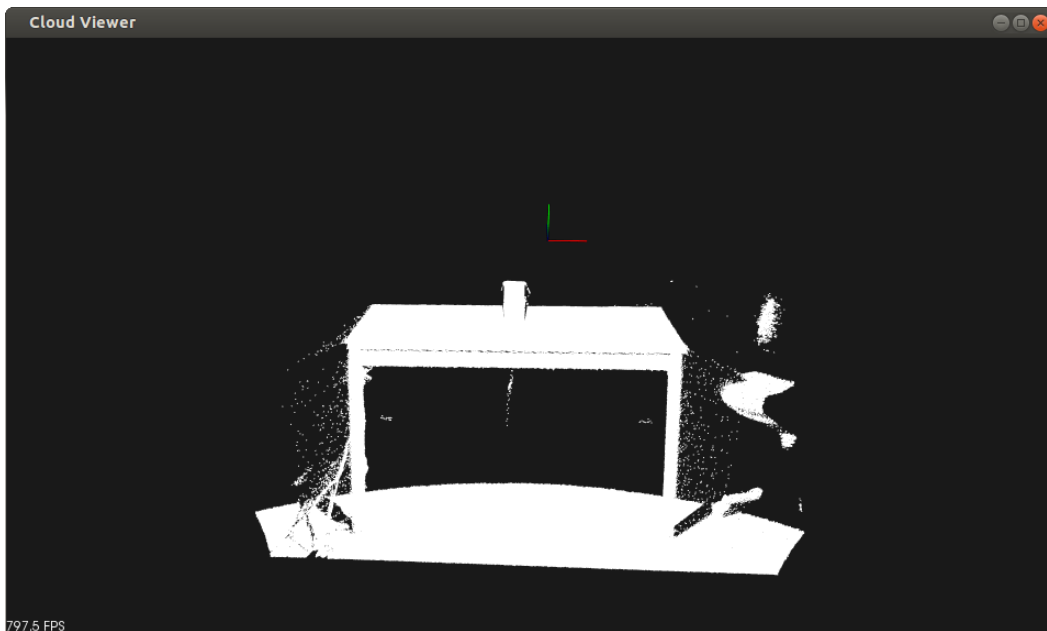


1 2 3 4 5 6 7 8 9 HomeComputerSystemBook_WebCmsBook_v2\chapters_1 correspondences Homography Tue Aug 15, 10:22

```
[INFO] [1408465361.22267132]: Number of inliers: 194
[INFO] [1408465361.304087151]: Homography = [0.2594207488133258, 0.07130039807112505, 154.16085646389506;
-0.09402652973855399, 0.5690299907138166, 125.9019634004552;
-0.0002584895332444258, 0.0001842759897805204, 1]
[INFO] [1408465361.467777655]: 1159 points found on the new image.
[INFO] [1408465361.923882389]: Number of inliers: 184
[INFO] [1408465361.935173483]: Homography = [0.3017223622904405, 0.1230630985743446, 144.001804084509;
-0.14254096081085, 0.5427850918346639, 180.051128907482;
-0.0004341069492488257, 0.0002670778519888032, 1]
[INFO] [1408465362.094010141]: 1091 points found on the new image.
[INFO] [1408465362.526516830]: Number of inliers: 191
[INFO] [1408465362.537928055]: Homography = [0.3309302108489008, 0.01505587115075966, 163.3228906350836;
-0.09401279046250406, 0.4707773590574327, 140.1050640828901;
-0.000256732942898491, 2.1396631218459901e-09, 0.9999999999999999]
[INFO] [1408465362.709381047]: 1088 points found on the new image.
```


Chapter 10: Point Clouds





```
$ rosrn chapter6_tutorials pcl_visualize
| Help:
-----
p, P : switch to a point-based representation
w, W : switch to a wireframe-based representation (where available)
s, S : switch to a surface-based representation (where available)

j, J : take a .PNG snapshot of the current window view
c, C : display current camera/window parameters
f, F : fly to point mode

e, E : exit the interactor
q, Q : stop and call VTK's TerminateApp

+/- : increment/decrement overall point size
+/- [+ ALT] : zoom in/out

g, G : display scale grid (on/off)
u, U : display lookup table (on/off)

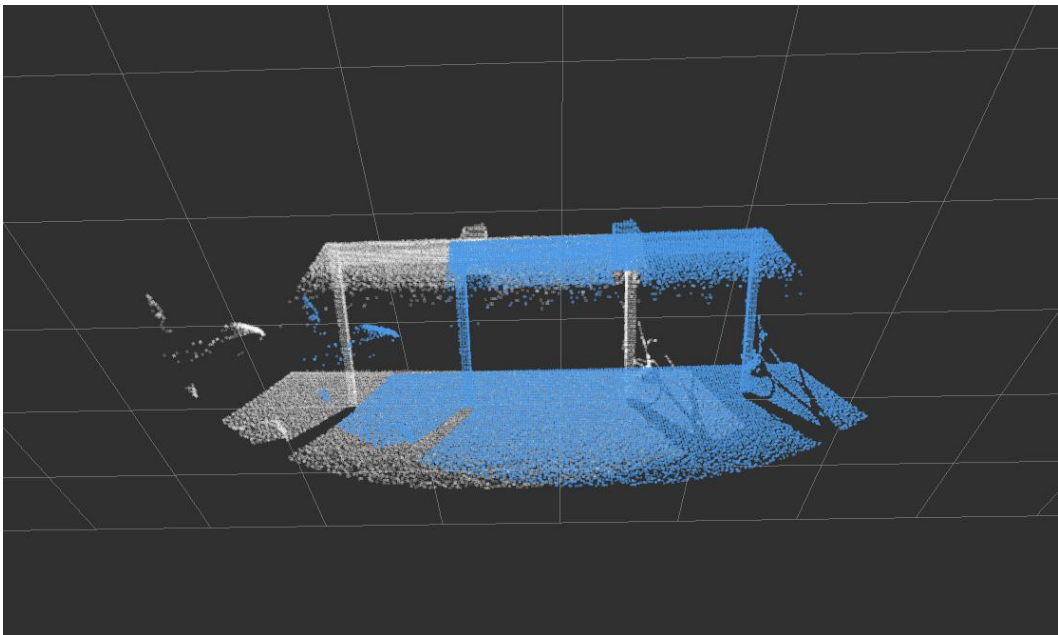
r, R [+ ALT] : reset camera [to viewpoint = {0, 0, 0} -> center_{x, y, z}]

ALT + s, S : turn stereo mode on/off
ALT + f, F : switch between maximized window mode and original size

l, L : list all available geometric and color handlers for the current actor map
ALT + 0..9 [+ CTRL] : switch between different geometric handlers (where available)
0..9 [+ CTRL] : switch between different color handlers (where available)


SHIFT + left click : select a point

x, X : toggle rubber band selection mode for left mouse button
```





Displays

- Grid
- PointCloud2
 - Status: Ok
 - Topic /pcl_segmented
 - Selectable
 - Style Flat Squares
 - Size (m) 0,1
 - Alpha 1
 - Decay Time 0
 - Position Tra... XYZ
 - Color Transf... FlatColor
 - Queue Size 10
 - Color  125; 200; 200
 - PointCloud2
 - Status: Ok
 - Topic /pcl_output
 - Selectable
 - Style Flat Squares
 - Size (m) 0,01
 - Alpha 1
 - Decay Time 0
 - Position Tra... XYZ
 - Color Transf... FlatColor
 - Queue Size 10

Color
Color to assign to every point.

