Introduction to ROS: Basics, Motion, and Vision
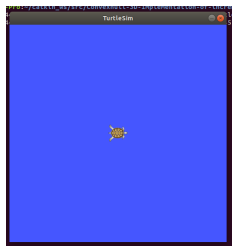
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Recap

**to start turtles sim**

rosrun turtlesim turtlesim_node

http://wiki.ros.org/turtlesim

Recap

1. How can we see the "turtlesim" node information?
2. Can you find out what is the topic that can be used to move the turtle?
3. Which topic or service can be used to set the speed?
4. How can we know the current pose of the robot?
5. Is there way to reset the robot back to its initial pose?
6. Can turtle change its color?
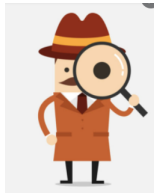
How can we see the "turtlesim" node information

to get turtles sim info

rosnode info /turtlesim

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

Subscriptions:
 * /turtle1/cmd_vel [unknown type]

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


contacting node http://op-X299-UD4-Pro:44807/ ...
Pid: 4355
Connections:
```

Let's try to change robot's speed

information about topics

rostopic echo <topic> print messages to screen
rostopic find <topic> checking topic by its type
rostopic bw <topic> bandwidth, i.e., data size, used by topic
rostopic hz <topic> publishing rate
rostopic info <topic> information about the topic
rostopic type <topic> check topic's type
rostopic list <topic> list down all the active topics
rostopic pub <topic> publish data to the specified topic

To see more information about each command, use -h, e.g., rostopic type -h

Let's try to change robot's speed

to control robot using teleoperation

rosrun turtlesim turtle_teleop_key
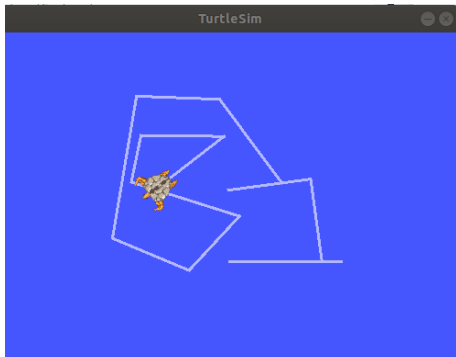
Let's try to change robot's speed

to check the speed

```
rostopic type /turtle1/cmd_vel
rostopic info /turtle1/cmd_vel
rosmsg show geometry_msgs/Twist
```

to publish velocity

```
rostopic pub [topic] [msg_type] [args]
rostopic pub -r 1 /turtle1/cmd_vel geometry_msgs/Twist
"linear: x: 0.0 y: 0.0 z: 0.0 angular: x: 0.0 y: 0.0 z: 0.0"
```

How to reset the robot?

information about services

rosservice list list down active services
rosservice find mes-type checking services by its message-type
rosservice info print service details
rosservice type <service> print service type
rosservice args <topic> service arguments
rosservice call <topic> call service with the arguments

To see more information about each command, use -h, e.g., rosservice type -h

How to add new robot?

to add new robot

```
rosservice call /spawn 2 1.6 0.8 "child_turtle"
```

Parameter Server Capabilities

information about parameters

rosparam list list down all the parameter names
rosparam delete <parameter> remove parameter from the server
rosparam get print value of the parameter
rosparam load file load the parameters from a file
rosparam set <parameter value> assign parameter to value
rosparam dump file save parameters to a file