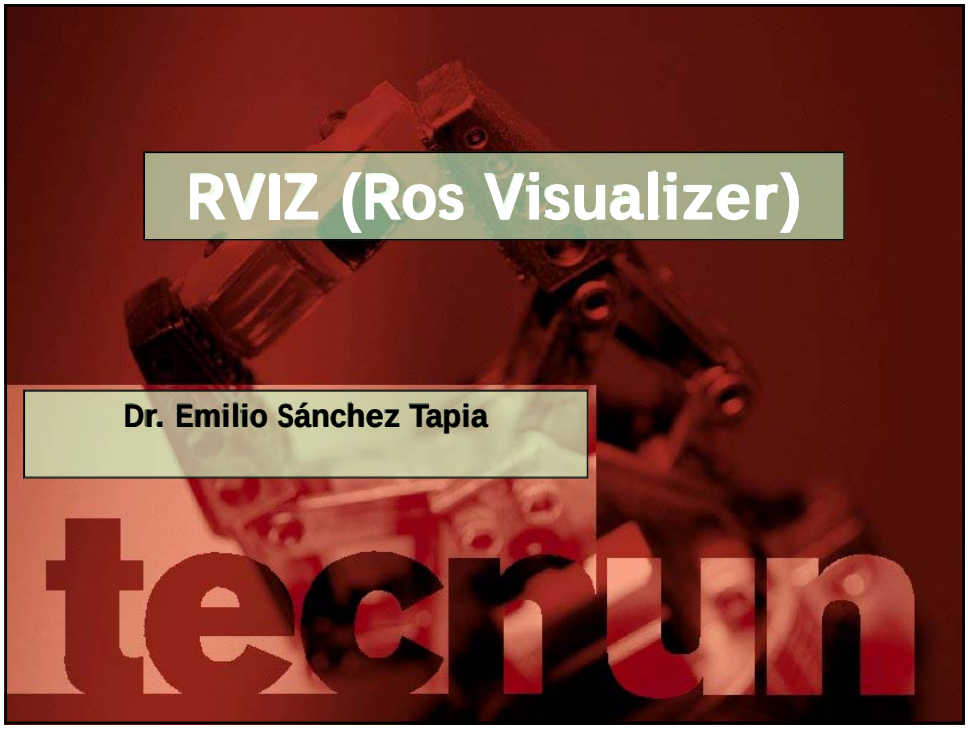
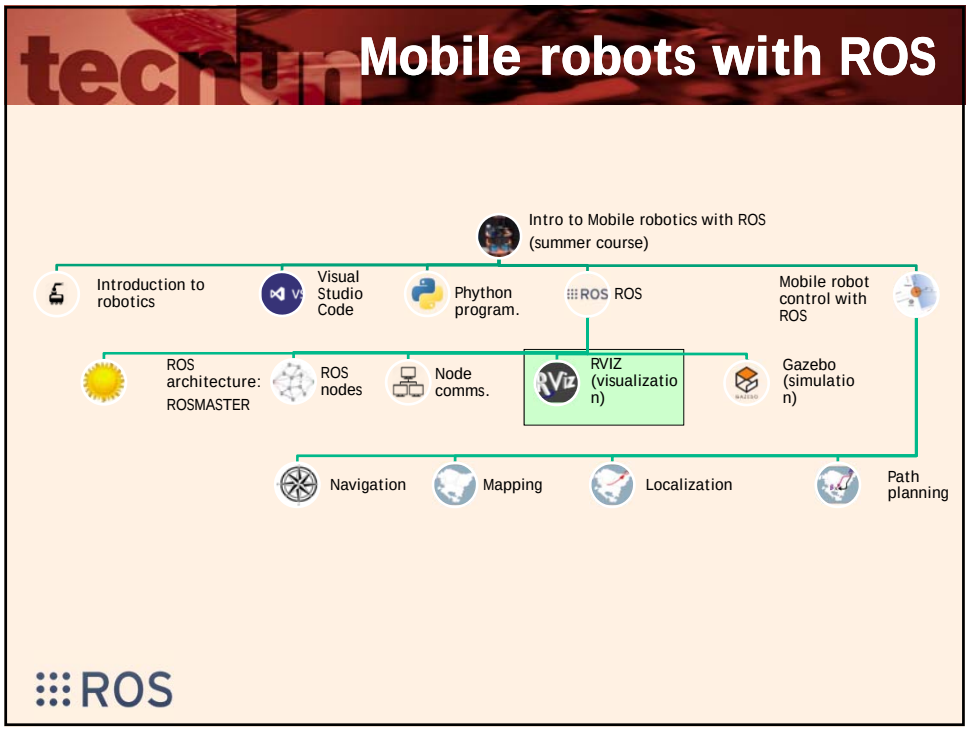
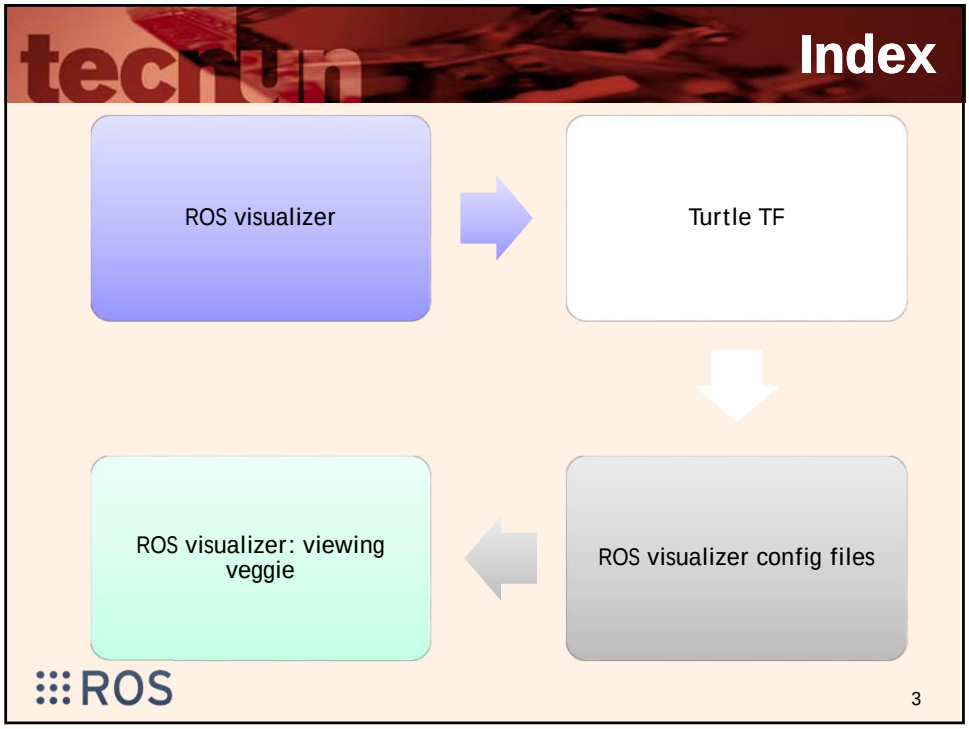

RVIZ (Ros Visualizer)
Dr. Emilio Sánchez Tapia
tecnun


tecnun
Mobile robots with ROS
Intro to Mobile robotics with ROS (summer course)
Introduction to robotics
Visual Studio Code
Phython program.
ROS
Mobile robot control with ROS
ROS architecture: ROSMASTER
ROS nodes
Node comms.
RVIZ (visualizatio n)
Gazebo (simulatio n)
Navigation
Mapping
Localization
Path planning
ROS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RVIZ: introduction

- 3D visualization tool for ROS
- Subscribes to topics and visualizes the message contents
- Different camera views (orthographic, topdown, etc.)
- Interactive tools to publish user information
- Save and load setup as RViz configuration
- Extensible with plugins
- Command line help

```
rosrun rviz rviz -help
```

- Run RViz with

```
rosrun rviz rviz -help
```

- More info → http://wiki.ros.org/rviz

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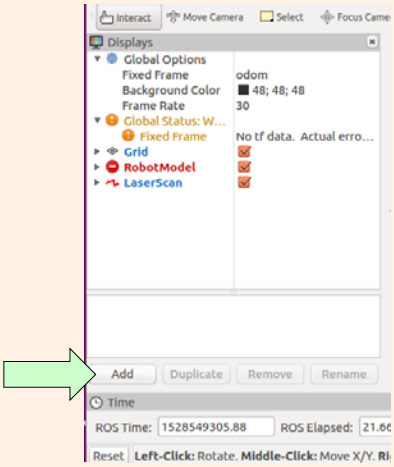
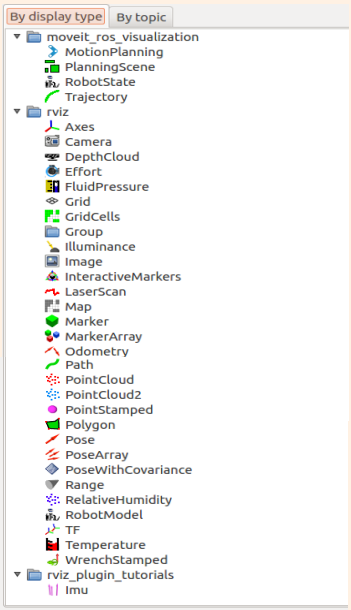
RVIZ: display plugins

- Push the button labeled with add





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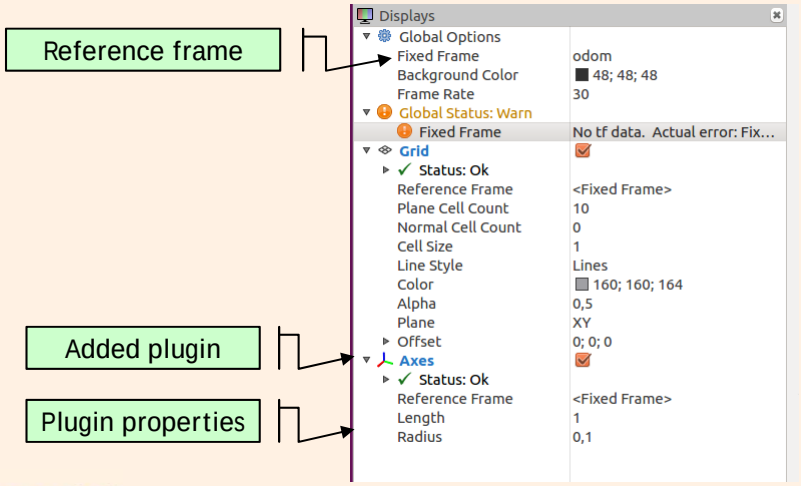
RVIZ: display plugins

- Once we insert a plugin, check its opctions



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RVIZ: viewing fixed frame

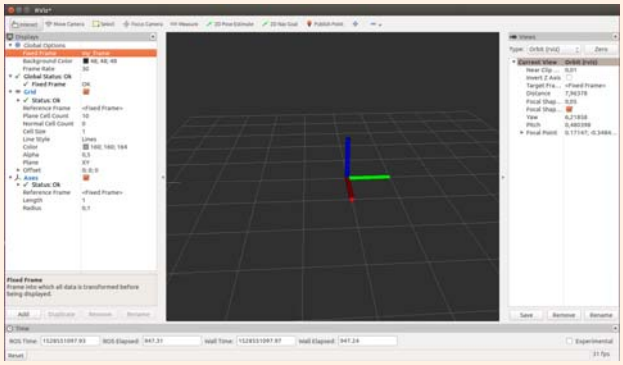
- If you have this error

No tf data. Actual error: Fixed Frame [odom] does not exist

→ Execute in a terminal

rosrun tf static_transform_publisher 0 0 0 0 0 0 1 map my_frame 10

And select *my_frame* as the Fixed Frame



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RVIZ: the most important plugins

Name	Description	Messages Used
Axes	Displays a set of Axes	
Effort	Shows the effort being put into each revolute joint of a robot.	sensor_msgs/JointStates
Camera	Creates a new rendering window from the perspective of a camera, and overlays the image on top of it.	sensor_msgs/Image, sensor_msgs/CameraInfo
Grid	Displays a 2D or 3D grid along a plane	
Grid Cells	Draws cells from a grid, usually obstacles from a costmap from the navigation stack.	nav_msgs/GridCells
Image	Creates a new rendering window with an Image. Unlike the Camera display, this display does not use a CameraInfo. Version: Diamondback+	sensor_msgs/Image
InteractiveMarker	Displays 3D objects from one or multiple Interactive Marker servers and allows mouse interaction with them. Version: Electric+	visualization_msgs/InteractiveMarker
Laser Scan	Shows data from a laser scan, with different options for rendering modes, accumulation, etc.	sensor_msgs/LaserScan
Map	Displays a map on the ground plane.	nav_msgs/OccupancyGrid
Markers	Allows programmers to display arbitrary primitive shapes through a topic	visualization_msgs/Marker, visualization_msgs/MarkerArray
Path	Shows a path from the navigation stack.	nav_msgs/Path
Point	Draws a point as a small sphere.	geometry_msgs/PointStamped
Pose	Draws a pose as either an arrow or axes.	geometry_msgs/PoseStamped
Pose Array	Draws a "cloud" of arrows, one for each pose in a pose array	geometry_msgs/PoseArray
Point Cloud(2)	Shows data from a point cloud, with different options for rendering modes, accumulation, etc.	sensor_msgs/PointCloud, sensor_msgs/PointCloud2
Polygon	Draws the outline of a polygon as lines.	geometry_msgs/Polygon
Odometry	Accumulates odometry poses from over time.	nav_msgs/Odometry
Range	Displays cones representing range measurements from sonar or IR range sensors. Version: Electric+	sensor_msgs/Range
RobotModel	Shows a visual representation of a robot in the correct pose (as defined by the current TF transforms).	
TF	Displays the tf transform hierarchy.	
Wrench	Draws a wrench as arrow (force) and arrow + circle (torque)	geometry_msgs/WrenchStamped
Oculus	Renders the RViz scene to an Oculus headset	

RVIZ: turtle_tf

- Close everyting and start from scratch
- Terminal 1

```
> roslaunch turtle_tf turtle_tf_demo.launch
```

- Try to move the turtles with the cursors
- Terminal 2

```
rosrun rviz rviz -d ‘rospack find turtle_tf’/rviz/turtle_rviz.rviz
```

- Change the options as it is showed in the following slide an play with the turtles (push arrow keys when ternimal 1 is active)

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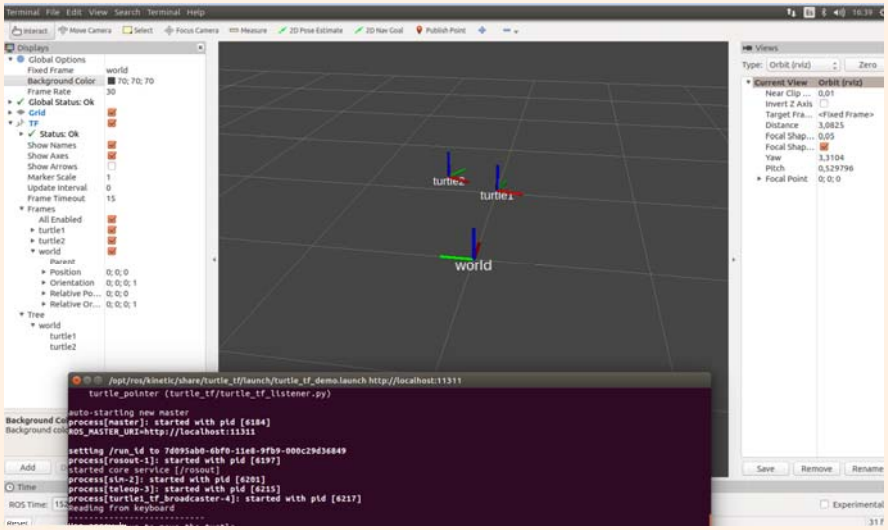
RVIZ: turtle_tf



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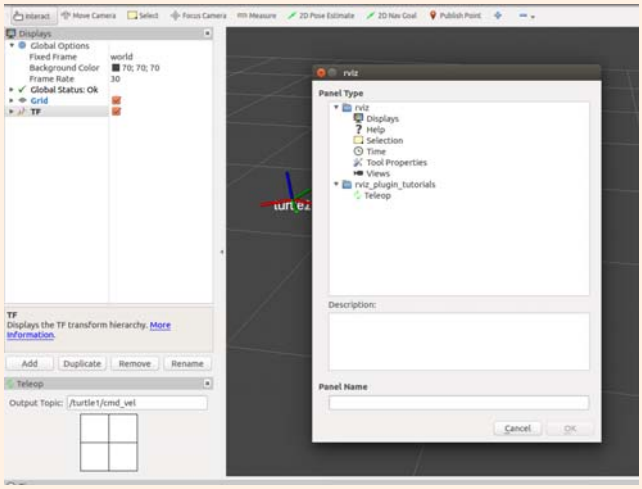
RVIZ: turtle_tf

- We can add a 'teleop' panel so we can control turtle1 directly from rviz



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ROS visualizer config files

RVIZ: save/load config

- Rviz can save/load config
- *.rviz files in the rviz folder of the package

- To load a stored configuration

```
rosrun rviz rviz -d ‘rospack find my_package’/rviz/config_file.rviz
```

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ROS visualizer: viewing veggie

ROS

RVIZ: running Veggie

- Process
  - Open Rviz

    ```
    rosrun rviz rviz
    ```

  - Configure Rviz
    - Put odom as the main frame
    - Add RobotModel
    - Add Laser topic (/scan)
  - Send commands to /cmd_vel

Move FWD

```
rostopic pub /cmd_vel geometry_msgs/Twist '{linear: {x: 1.0}}'
```

rosSPIN

```
rostopic pub /cmd_vel geometry_msgs/Twist '{angular: {z: 1.0}}'
```

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