

AA 274A: Principles of Robot Autonomy I

Section 4

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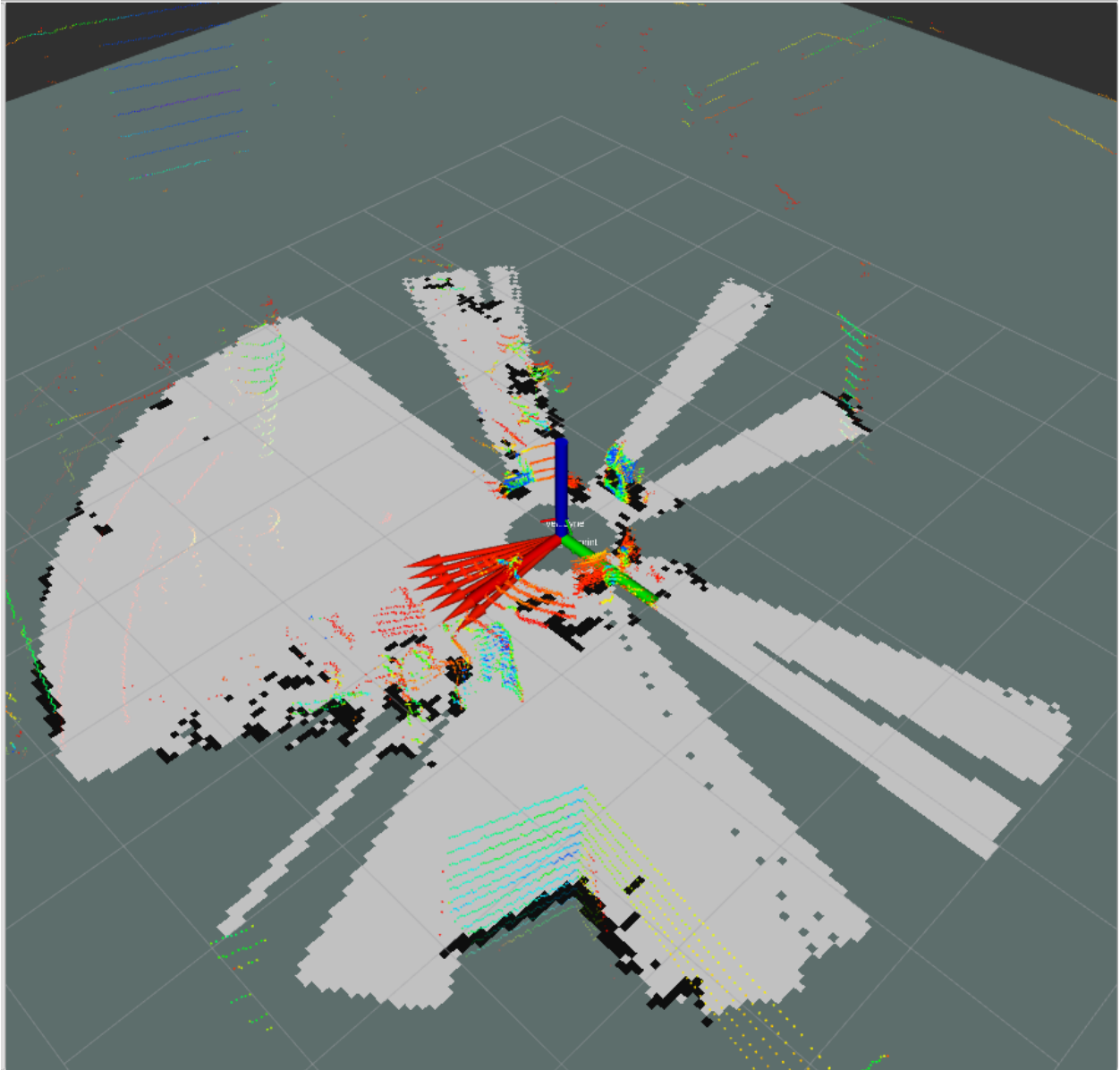
1 Problem 1

1. /battery_state
2. /cmd_nav
3. /cmd_vel
4. /cmd_vel_rc100
5. /diagnostics
6. /firmware_version
7. /imu
8. /joint_states
9. /magnetic_field
10. /map
11. /map_metadata
12. /motor_power
13. /move_base_simple/goal
14. /odom
15. /reset
16. /rosout
17. /rosout_agg
18. /scan
19. /sensor_state
20. /sound
21. /tf
22. /tf_static

- 23. /turtlebot3_slam_gmapping/entropy
- 24. /velodyne_nodelet_manager/bond
- 25. /velodyne_nodelet_manager_driver/parameter_descriptions
- 26. /velodyne_nodelet_manager_driver/parameter_updates
- 27. /velodyne_nodelet_manager_laserscan/parameter_descriptions
- 28. /velodyne_nodelet_manager_laserscan/parameter_updates
- 29. /velodyne_nodelet_manager_transform/parameter_descriptions
- 30. /velodyne_nodelet_manager_transform/parameter_updates
- 31. /velodyne_packets
- 32. /velodyne_points
- 33. /velodyne_points_throttle

2 Problem 2

Information Visualization with rviz:



3 Problem 3

Contents of .rviz configuration file:

Panels:

- Class: rviz/Displays
Help Height: 78
Name: Displays
Property Tree Widget:
Expanded:
 - /Global Options1
 - /Status1Splitter Ratio: 0.5
Tree Height: 719
- Class: rviz/Selection
Name: Selection
- Class: rviz/Tool Properties
Expanded:
 - /2D Pose Estimatel
 - /2D Nav Goall
 - /Publish PointlName: Tool Properties
Splitter Ratio: 0.5886790156364441
- Class: rviz/Views
Expanded:
 - /Current View1Name: Views
Splitter Ratio: 0.5
- Class: rviz/Time
Experimental: false
Name: Time
SyncMode: 0
SyncSource: PointCloud2

Preferences:

- PromptSaveOnExit: true

Toolbars:

- toolButtonStyle: 2

Visualization Manager:

Class: ""

Displays:

- Alpha: 0.5
Cell Size: 1
Class: rviz/Grid
Color: 160; 160; 164
Enabled: true
Line Style:
 - Line Width: 0.029999999329447746
 - Value: LinesName: Grid
Normal Cell Count: 0
Offset:
 - X: 0
 - Y: 0
 - Z: 0

```
Plane: XY
Plane Cell Count: 10
Reference Frame: <Fixed Frame>
Value: true
- Alpha: 1
Autocompute Intensity Bounds: true
Autocompute Value Bounds:
  Max Value: 10
  Min Value: -10
  Value: true
Axis: Z
Channel Name: intensity
Class: rviz/PointCloud2
Color: 255; 255; 255
Color Transformer: Intensity
Decay Time: 0
Enabled: true
Invert Rainbow: false
Max Color: 255; 255; 255
Min Color: 0; 0; 0
Name: PointCloud2
Position Transformer: XYZ
Queue Size: 10
Selectable: true
Size (Pixels): 3
Size (m): 0.009999999776482582
Style: Flat Squares
Topic: /velodyne_points
Unreliable: false
Use Fixed Frame: true
Use rainbow: true
Value: true
- Alpha: 0.699999988079071
Class: rviz/Map
Color Scheme: map
Draw Behind: false
Enabled: true
Name: Map
Topic: /map
Unreliable: false
Use Timestamp: false
Value: true
- Angle Tolerance: 0.10000000149011612
Class: rviz/Odometry
Covariance:
  Orientation:
    Alpha: 0.5
    Color: 255; 255; 127
    Color Style: Unique
    Frame: Local
    Offset: 1
    Scale: 1
    Value: true
  Position:
```

```
Alpha: 0.30000001192092896
Color: 204; 51; 204
Scale: 1
Value: true
Value: true
Enabled: true
Keep: 100
Name: Odometry
Position Tolerance: 0.10000000149011612
Queue Size: 10
Shape:
  Alpha: 1
  Axes Length: 1
  Axes Radius: 0.10000000149011612
  Color: 255; 25; 0
  Head Length: 0.30000001192092896
  Head Radius: 0.10000000149011612
  Shaft Length: 1
  Shaft Radius: 0.05000000074505806
  Value: Arrow
Topic: /odom
Unreliable: false
Value: true
- Alpha: 1
  Class: rviz/Axes
  Enabled: true
  Length: 1
  Name: Axes
  Radius: 0.10000000149011612
  Reference Frame: <Fixed Frame>
  Show Trail: false
  Value: true
- Class: rviz/TF
  Enabled: true
  Frame Timeout: 15
  Frames:
    All Enabled: true
    base_footprint:
      Value: true
    map:
      Value: true
    odom:
      Value: true
    velodyne:
      Value: true
  Marker Alpha: 1
  Marker Scale: 1
  Name: TF
  Show Arrows: true
  Show Axes: true
  Show Names: true
  Tree:
    map:
      odom:
```

```
        base_footprint:
          velodyne:
            {}
      Update Interval: 0
      Value: true
Enabled: true
Global Options:
  Background Color: 48; 48; 48
  Default Light: true
  Fixed Frame: map
  Frame Rate: 30
Name: root
Tools:
  - Class: rviz/Interact
    Hide Inactive Objects: true
  - Class: rviz/MoveCamera
  - Class: rviz/Select
  - Class: rviz/FocusCamera
  - Class: rviz/Measure
  - Class: rviz/SetInitialPose
    Theta std deviation: 0.2617993950843811
    Topic: /initialpose
    X std deviation: 0.5
    Y std deviation: 0.5
  - Class: rviz/SetGoal
    Topic: /move_base_simple/goal
  - Class: rviz/PublishPoint
    Single click: true
    Topic: /clicked_point
Value: true
Views:
  Current:
    Class: rviz/Orbit
    Distance: 10.335333824157715
    Enable Stereo Rendering:
      Stereo Eye Separation: 0.05999999865889549
      Stereo Focal Distance: 1
      Swap Stereo Eyes: false
      Value: false
    Focal Point:
      X: 0
      Y: 0
      Z: 0
    Focal Shape Fixed Size: true
    Focal Shape Size: 0.05000000074505806
    Invert Z Axis: false
    Name: Current View
    Near Clip Distance: 0.009999999776482582
    Pitch: 0.785398006439209
    Target Frame: <Fixed Frame>
    Yaw: 0.785398006439209
  Saved: ~
Window Geometry:
  Displays:
```

```
    collapsed: true
Height: 1016
Hide Left Dock: true
Hide Right Dock: true
QMainWindow State: 000000ff00000000fd0000000040000000000000001560000035afc02000
00008fb00000001200530065006c0065006300740069006f006e00000001e100000009b00000005c00fffffffb00
Selection:
    collapsed: false
Time:
    collapsed: false
Tool Properties:
    collapsed: false
Views:
    collapsed: true
Width: 1848
X: 72
Y: 27
```


4 Problem 4

Screenshot of our marker:

