

Kinect + ROS = Navigation

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The Kinect Sensor

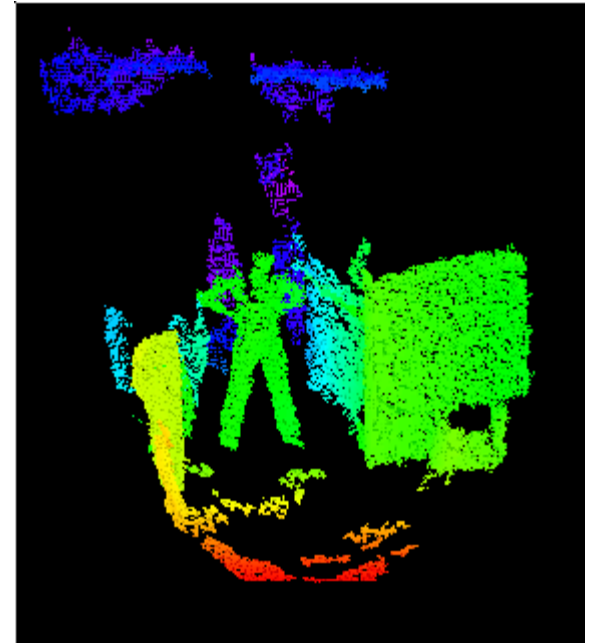
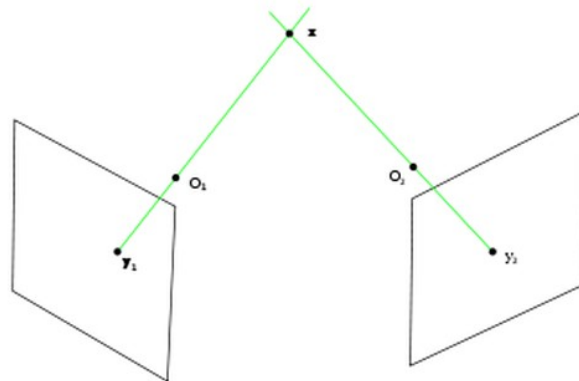
- 30 Hz, RGB 8-bit VGA (640 x 480) video
- 30 Hz, 11 bit gray scale depth video (2,048 levels)
- Tracking range: 0.7–6 m (2.3–20 ft)
- Angular field of view:
 - 57° horizontally
 - 43° vertically



Depth from Structured Light

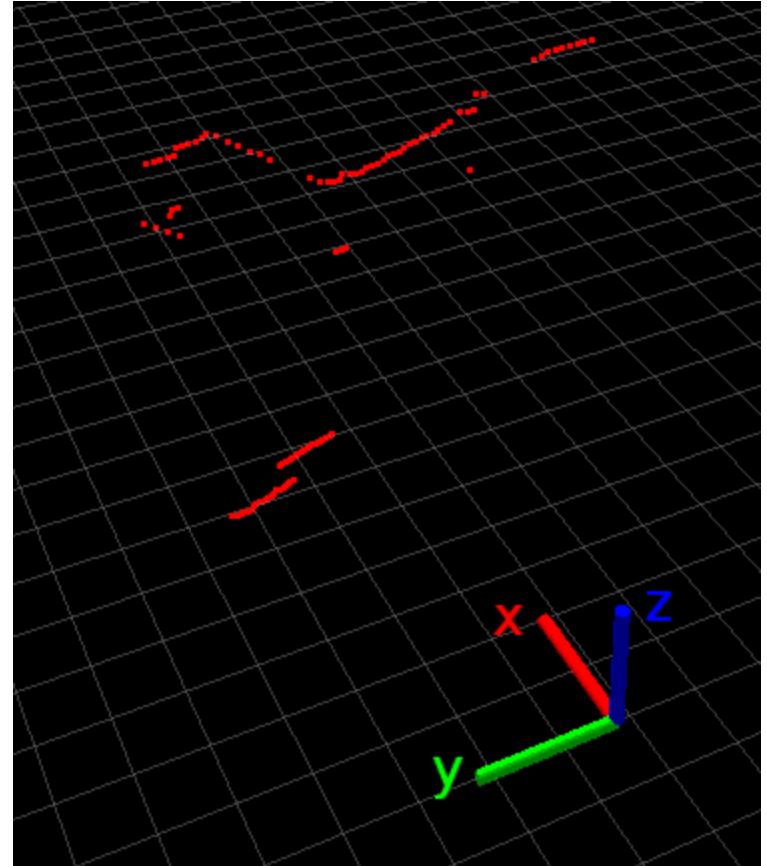


By Joseph L. Flatley



Faking a Laser Scanner

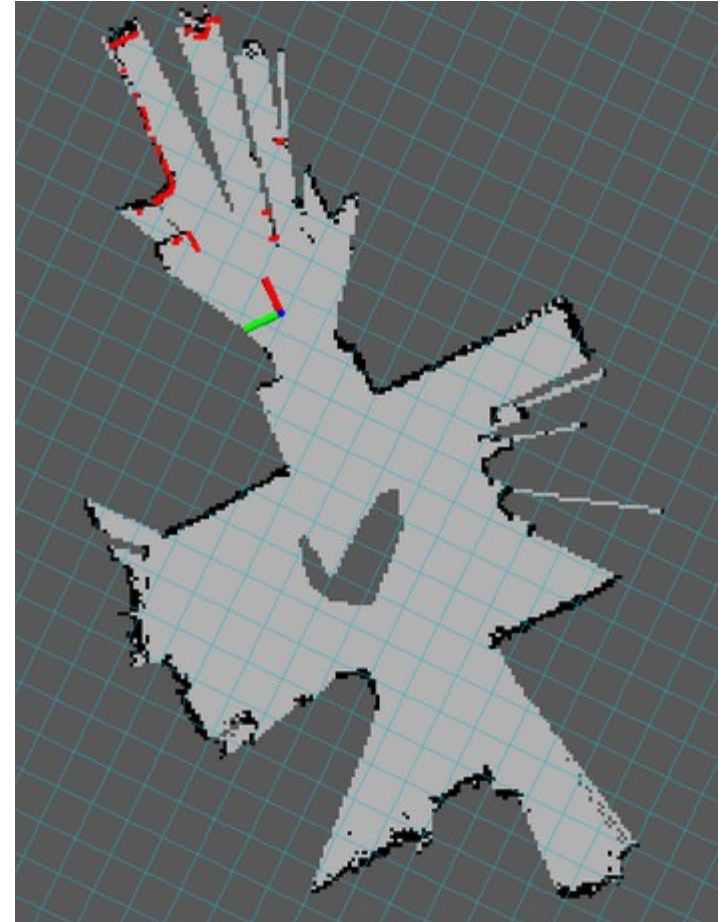
- Cut a slice out of the Kinect depth image
- Get closest value in each column



SLAM

(Simultaneous Localization and Mapping)

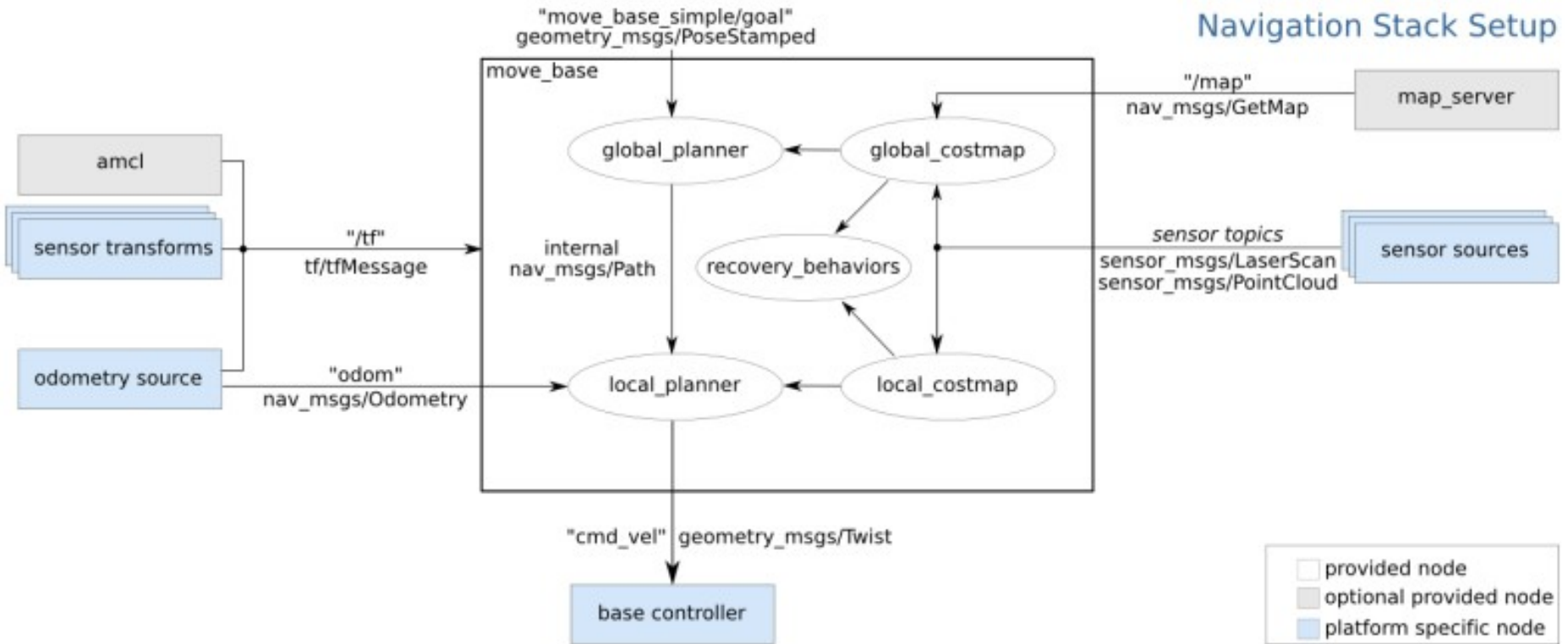
- Odometry
- Laser depth data
- Extract features
- Model probabilistically
- Generate most likely map



Navigation

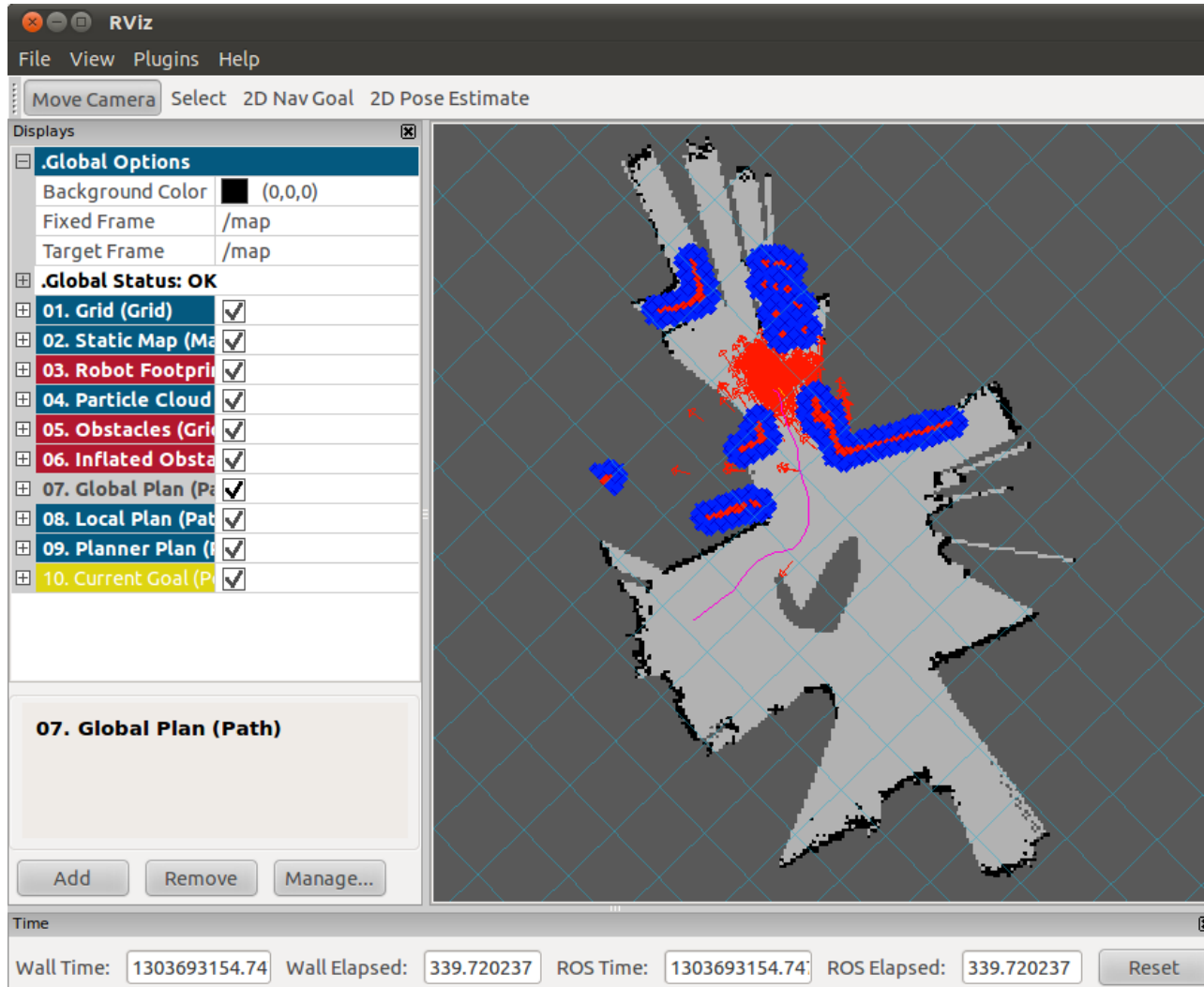
- Map
- Start pose, goal pose
- Global plan
- Monte Carlo Localization for pose estimation (where am I?)
 - Odometry
 - Laser scan data
- Local plan → drive commands

ROS Navigation Stack



from
<http://www.ros.org/wiki/navigation/Tutorials/RobotSetup>

Navigation in Action



http://www.youtube.com/watch?v=j-5iaRHZIM&feature=player_detailpage

Questions?

