

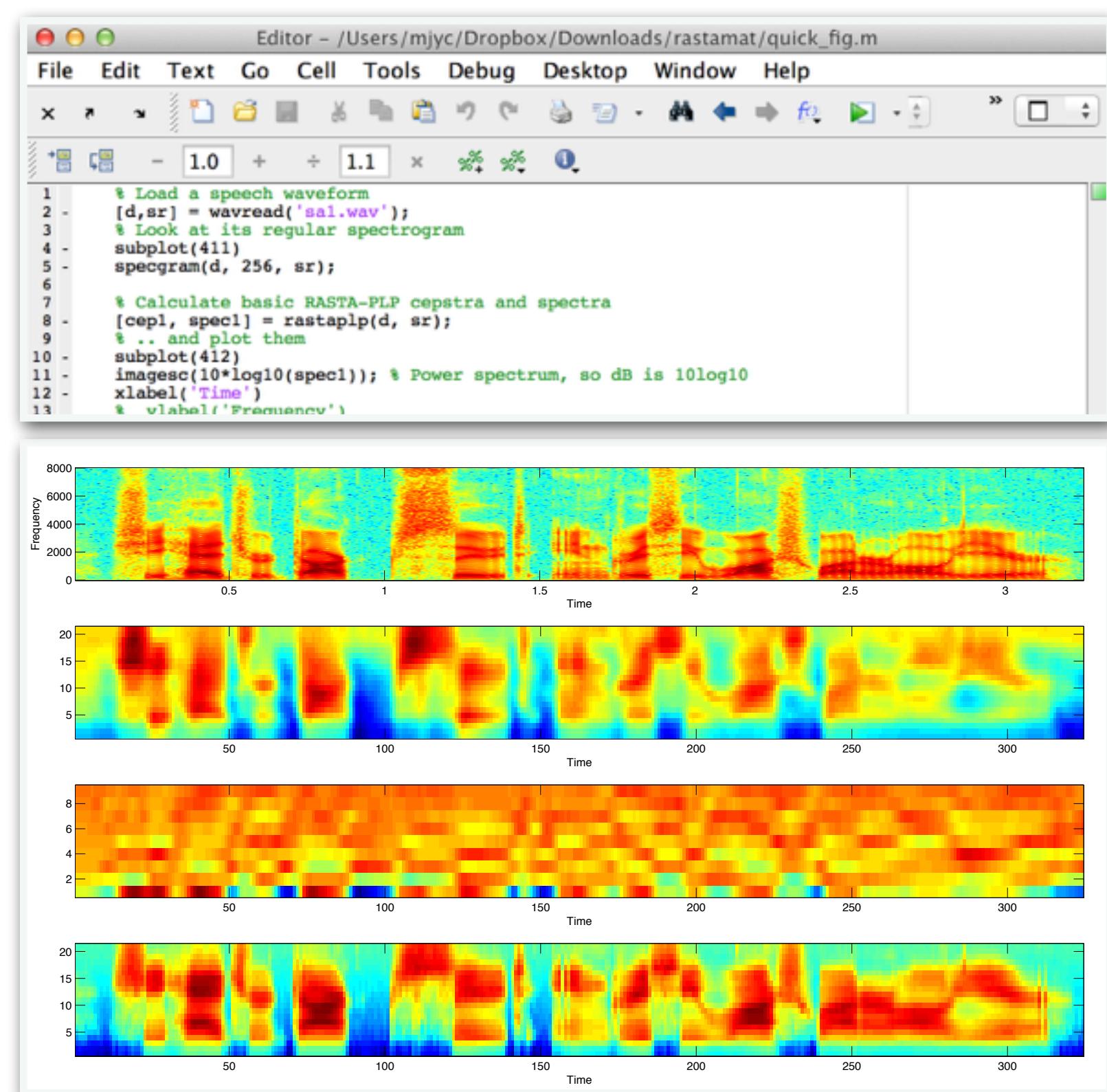
rqt_bag_diff: Tool for Visual Comparisons of Robot Sensor Data

Motivation

Comparing and inspecting sensor data around two different time points is useful for various tasks, such as building event detectors, e.g., a *door open* event detector.

Common Approach 1

Dump sensor data into a file, do analysis in Matlab, R, python, etc...

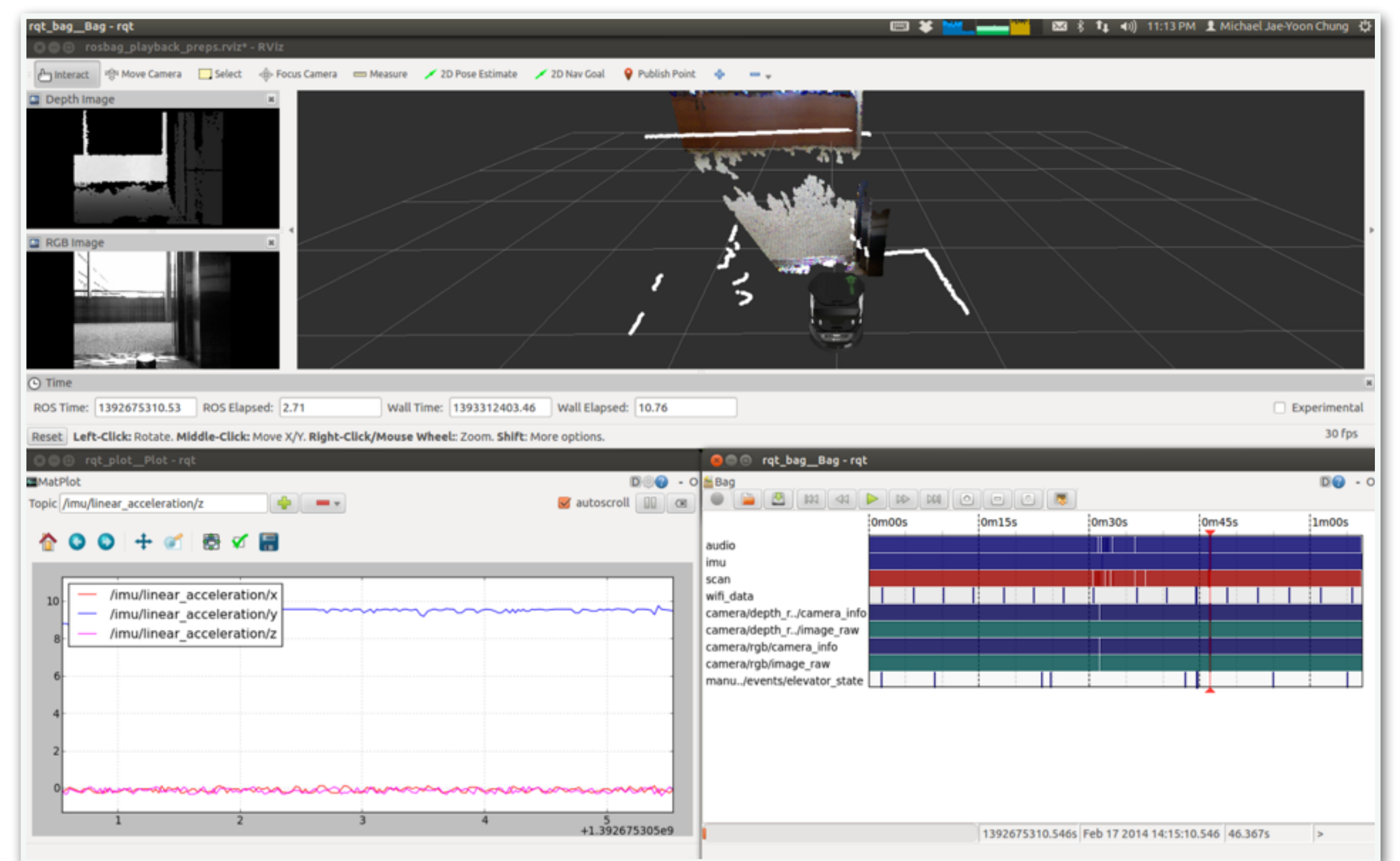


Problems?

- Data (often > 10gb) don't fit in memory.
- Scripts are error prone and often not general purpose

Common approach 2

Use ROS tools. Use `rqt_bag` to display and replay sensor data, `rviz` to display replayed sensor data in simulated 3D environment and use `rqt_plot` to plot numerical data.



Let's see how one might use this system to build an event detector...

- Step1. Find a timepoint of interest and replay the sensor data around it.
- Step2. Memorize replayed sensor data in *your head*.
- Step3. Repeat the same procedure for other timepoints of interests.
- Step4. Come up with an idea for building an event detector, e.g., classifier.

Our Approach

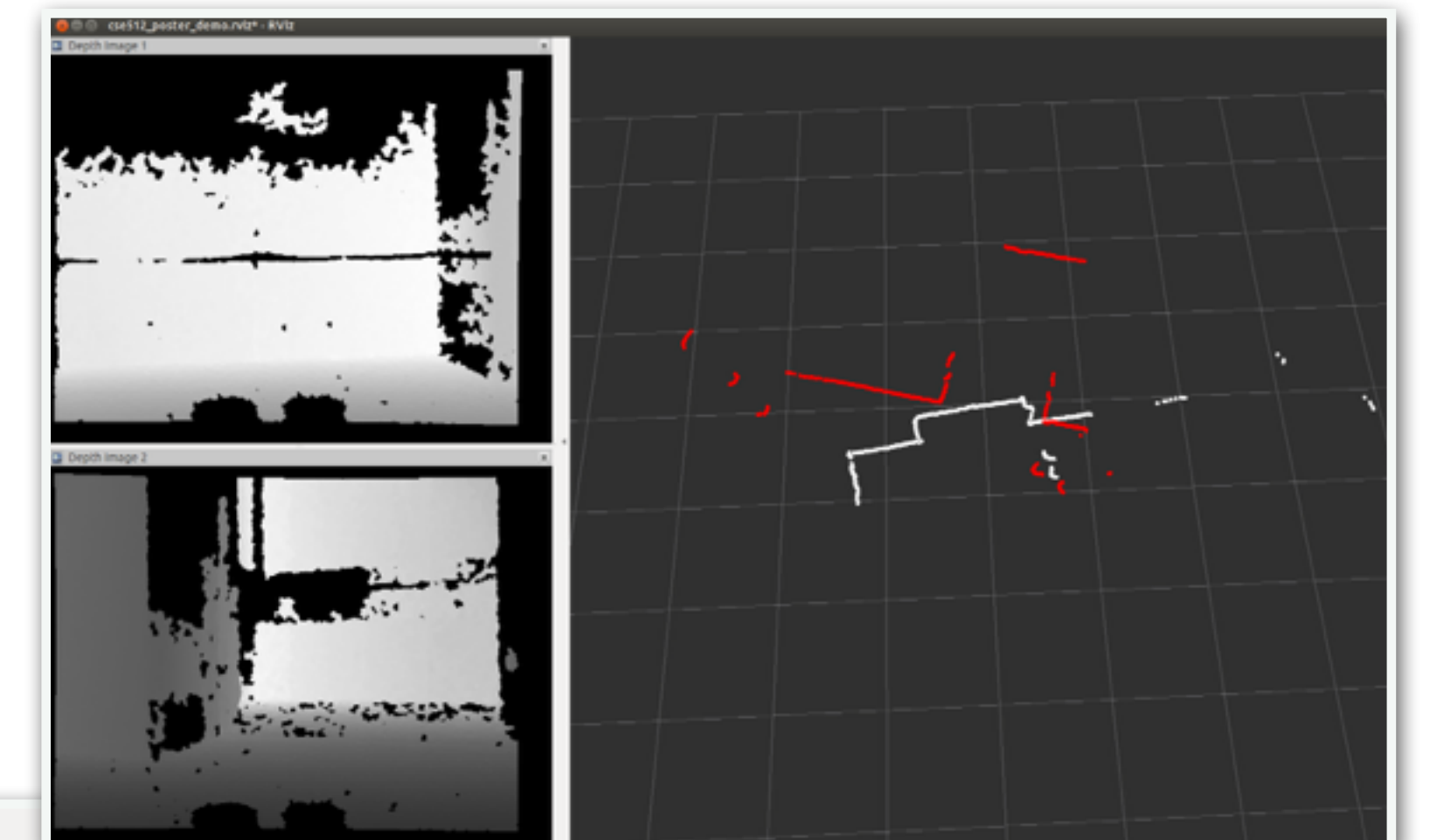
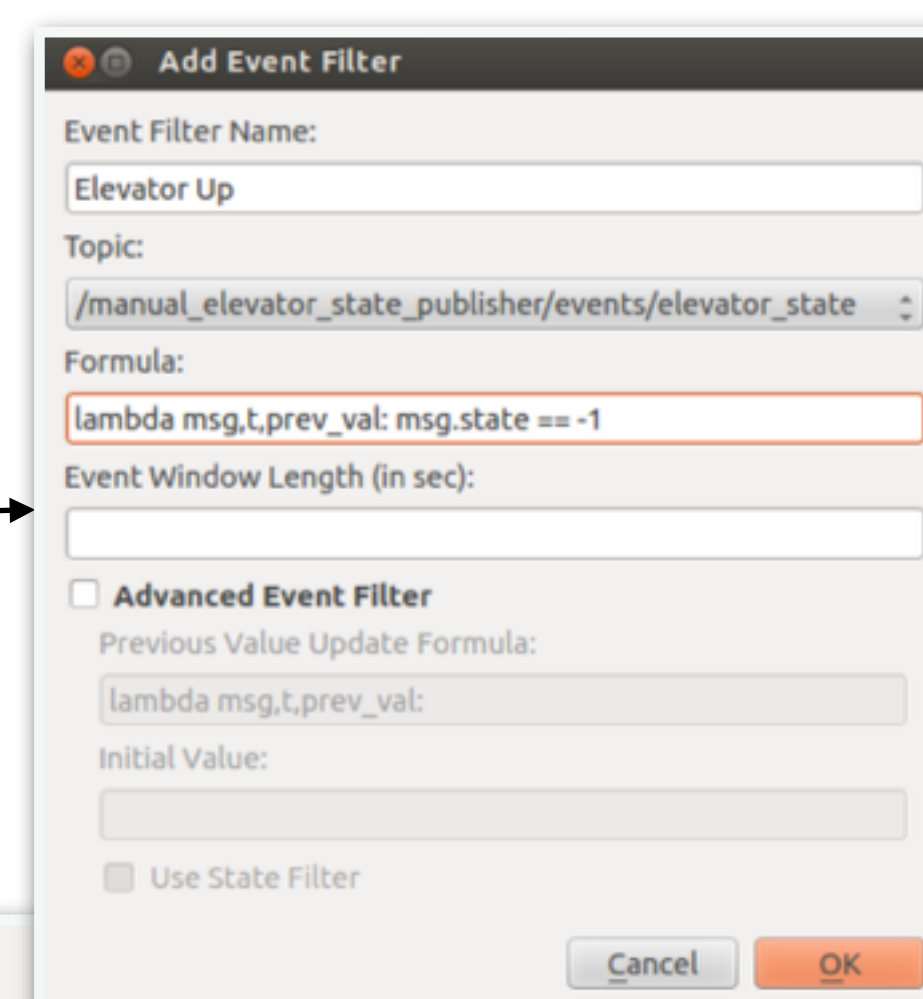
Stay in ROS to take advantage of available visualization tools and provide additional data inspection and comparison functionalities.

Synchronized playback controls

Add Event Filter: Tool to locate timepoints of interest on-the-fly

Event Filter Selector

Navigate between timepoints of interest, such as events



Use of existing visualization tools. One can visualize sensor data from two different sources

Conclusion

- Comparing two timepoints of interest in robotic sensor data is difficult because
 - manipulating often big sensor data (>10gb) is not trivial.
 - other tools that can deal with large data do not support visual comparisons.
- We provided a solution program that addresses these two challenges by providing a diff-like functionality to existing sensor data analysis software.
- In future, we plan to extend our tool to support event-classifiers visualizations.

