When working with robotics and vision it is very helpful during development and for demonstrations to be able to visualize certain information otherwise hidden to us. Examples include raw data from range sensors such as laser and sonar sensors, maps of the environment built by the robot, the location of interest points extracted from visual information.

Figure shows an example of how the currently used visualization program display the map created by one of our robots. This visualization program is not very flexible anymore as it was a design for a specific purpose and has now been patched over and over to incorporate more and more functionality. This project would take a step back and make a new design that takes all the new requirements into account and making it easy to extend with new information.

Strict requirements are

- Has to run under Linux
- Has to run on the same computer that is running the process we are visualizing things from. This means that it should be lightweight so that it does not effect the performance to much.
- Must be easy to extend with new graphical items to be displayed, that is, adding support for an displaying ellipsoids should not means that you have to rewrite everything.
- Use some kind of scene graph representation so that one can specify the position of objects relative to the frame they are attached to and not the global base frame. For example the head of the person is attached to the body of the person and moves when the person moves.
- Must handle at least two different base coordinate systems that with an adjustable transformation in between. This way one coordinate system can contain ground truth data and the other something generated by the robot that is compared to the ground truth.

Some desired properties are

- As few dependencies on other packages as possible so that it is easy to ship and install.
Figure 1: Example of a model generated by a mobile robot displayed in a visualization program.

- Run on other platforms
- Capture snapshots and movies directly in the visualization tool
- Dynamically define coordinate system attached to other coordinate systems to which positions of objects can be related.