Graphical User Interface in JDE robot applications

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Introduction

Why do we need GUI in robot applications?

- Debugging
  - See sensor readings
  - See internal data
  - Command actuators
  - Change internal values
- Behavior is the main issue, not the GUI
- It should not disturb autonomous operation
Design of visualization in JDE

- Robot application is a set of schemas
- Each schema is implemented as a thread with iterative execution
- There is one schema for GUI
  - refresh display with new data
  - check for user interaction (buttons, sliders...)
- Its iteration frequency is under control
- Remote GUI: remote servers oculo and otos
- X-Window system on Linux: Qt, GTK+, XForms,...
XForms library

- Non-blocking mode of operation
- Pool of graphic objects for GUI
  - canvas
  - images
  - sliders
  - positioner
  - text input/output
  - ...

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Examples

- Teleoperation and sensor readings
- Maps, grids and route planning
- 2D and 3D particles
- Several cameras and filtered colors
- Composed scene and temporal evolution
Examples
Maps, grids and route planning
2D particles
3D particles
Several cameras and filtered color
Composed scene and temporal evolution
Conclusions

- Processing time devoted to GUI is under control in JDE robot applications
- GUI can be disabled without recompiling
- Debugging is easy with JDE programmed GUIs
- Future: visualization of 3D data using virtual camera, OpenGL