Embedding Visualization Applications with PyGR

Object oriented interfaces and PyQt/PySide bindings for GR - a universal framework for visualization applications

Georg Brandl, Christian Felder, Josef Heinen

GR has been integrated into NICOS, a network-based experiment and instrument control system used for neutron scattering experiments at FRM II in Munich.

PyGR

- Object oriented interface on top of GR
- Convenience functions for
  - Zooming
  - Panning
  - Selecting a Region
  - Detecting predefined Regions Of interest (point in polygon test)
- Independent of GUI Toolkits
- Manipulating object states instead of fiddling with procedure calls
- Adding new functionality using derived objects, e.g.
  - Clamp minimum values for selecting a Region of Interest (xmin, xmax > 0)

GR

- Gرافics Library optimized for real-time data visualizations
- Procedural graphics backend (written in C)
- Does not rely on creation of figures
  - Representation of continuous data streams
  - Based on a Graphical Kernel System
  - Device and Platform independent API
  - Large scale of graphical device drivers/plugins:
    - Qt, wxWidgets, X11, Quartz, Win32
    - PostScript, PDF, SVG
    - GIF, BMP, PNG, TIFF
    - MOX (MPEG4)
    - HTML5
- Built-in support for 2D plotting and OpenGL (GR3)
  - Coexistent 2D and 3D world

QtGR

- Qt Widgets for drawing and interacting with GR
- Specialized Qt Events, e.g., Mouse Events in different coordinate systems (Normalized, Device- and World Coordinates)
  - MouseEvent
  - WheelEvent
  - PickEvent
  - ROEvent
  - LegendEvent
- Support for PyQt and PySide

Ongoing Projects

- General purpose 3D plotting objects in PyGR
- Integrated live view for three-dimensional data
- Generation of SVG plots for HTML status monitor
- Generation of status monitoring panels

Contact: c.felder@fz-juelich.de - Website: www.fz-juelich.de, gr-framework.org