 WIRED for LCD Analysis

Mark Dönszelmann

Linear Collider Simulation Workshop
May 19-22, 2003, SLAC
Content

- Introduction to WIRED
- Overview of the functionality in WIRED 3
- Limitations of WIRED 3
- Plans for WIRED 4
- Conclusions
Features

- Experiment independent Framework for Event Displays in Java
- 3D Wire Frames
- Interactivity (Rotate, Zoom, Translate)
- Picking
- Special projections
- Layering of Graphics Primitives
- HepRep compliant (not for LCD yet)
- Client-Server model
- Publish quality output

Experiments and Users

- BaBar, LCD and GLAST
- GEANT4
WIRED

History and WIRED Versions

- **Version 1:** Basic Framework, used by ATLAS, BaBar, CHORUS, Delphi, LCD Plugin (JAS2 only)
- **Version 2:** Prototype for ATLAS
- **Version 3:** Stand-alone Generic WIRED for HepRep1, HepRep2, and WIRED’s internal data representation, used by BaBar, GLAST and LCD
- **Version 3.1:** Stand-alone Generic WIRED and Plugin for JAS3 (LCD only)
- **Version 4:** Generic WIRED for HepRep2, which uses HepRep2 as its internal data structure.
FreeHEP Java Library

WIRED functionality moved to the FreeHEP Library
- HepRep 2 Interfaces and Implementation
- VectorGraphics Export Formats (CGM, EMF, PDF, PS, SVG, SWF)
- Utility classes

JAS functionality moved to the FreeHEP Library
- Application Framework and Plugin Functionality
- Printing Handling
- Utility classes
Opening a DataSet
WIRED

Basic Usage (view and tree)
Browsing Events
Toggling visibility
WIRED

Orientation Actions

- Orientation Actions
- Orientation Toolbar
- Projection
- Mouse Function
- Drawing Options

All Projections

- Reset
- Parallel Projection
  - Fit to Window
  - Reset Scaling
  - Center in Window
  - Reset Rotation
  - Reset Translation
  - Side View
  - Top View
  - Beam View
  - Auto Rotate
  - Auto Fly
Parallel Projection

[JAS3 Diagram]

- Orientation Actions
- Orientation Toolbar
- Projection: FishEye, Rho-Z, Parallel
- Mouse Function: TRACK, EndCap
- Drawing Options: 2D, 3D, Parallel

Mark Dönszelmann, SLAC  Linear Collider Simulation Workshop, May 19-22, 2003
WIRED

Fish-Eye Projection

◆ Blows up Center, compresses Outwards
WIRED

Rho-Z Projection

◆ Cuts detector and folds up two halves
WIRED

Mouse Function

- Orientation Actions
- Orientation Toolbar
- Projection
- Mouse Function
- Drawing Options

General
- PickRectangle
- PickWedge
- PickCircle
- PickPolygon
- PickToMeasure
  When Item is Selected
- Show Attributes
- Make Viewable in Event Visibility Control
  Parallel Projection
- Scaling
- Translation
- Rotation
WIRED Rotation, Scaling and Translation
WIRED

Picking

- Highlights picked items by low-lighting the rest
Frames and Layering

- Drawing Primitives may have frames around them.
- Resulting Drawing is layered from front to back:
  - Hits
  - Hit-Frames
  - Tracks
  - Track-Frames
  - Calorimeter Hits
  - Calorimeter Hit-Frames
  - Geometry
  - Geometry-Frames
  - Background
- AntiAliased - Lines look smoother
WIRED

Drawing Options

- Aliased
  - Ragged Edges
  - Without Frames

- AntiAliased
  - Blends in background
  - With Frames
WIRED

❖ Uses Printing Service in JAS 3
❖ Preview
Exports to a number of Vector Graphics Formats:

- **CGM**: Computer Graphics Metafile
- **EMF**: Windows Enhanced MetaFile (Copy-Paste)
- **EPS/PS**: Encapsulated PostScript
- **PDF**: Portable Document Format
- **SVG**: Scalable Vector Graphics
- **SWF**: ShockWave Format

- **JAVA**: creates java source file for debugging output formats

and a number of BitMapped Formats:

- **GIF, JPEG, PNG, PPM**
Limitations

- One WIRED Plot per Page
- No Save and Restore
- No Picking Info
- No easy way to extend WIRED
- Memory Consumption
WIRED 4

Set of Components and Services
- Better interaction with JAS3
- WIRED Plots more like JAS Plots, more than one per page
- To be used by other plugins in JAS 3
- To use other services in JAS 3

HepRep 2
- Internal Data Structure for WIRED, less memory consumption
- LCD data as HepReps
- Physics information on Picking
- Programmatic access for filtering
WIRED 4: HepRep Plot
Conclusions

WIRED 3

- LCD Plugin for JAS 3
- Standard Event Display functionality
- and
  - Special Projections
  - Publish quality output

More to come in WIRED 4

- HepRep 2
- Programmatic access to Event Display for Filtering
- More interaction with JAS 3