

Evolution of the Graphics Work Package

- **Consolidation of the existing components.** Several existing parts need to be improved, redefined, consolidated, or rewritten (TGaxis rewrite, need for a true NDC space of coordinates, revisit the “margin” mechanism for pad, etc ...). This might not bring some new functionality in the system but it will give more robustness, ease the maintenance and open door for new functionalities.

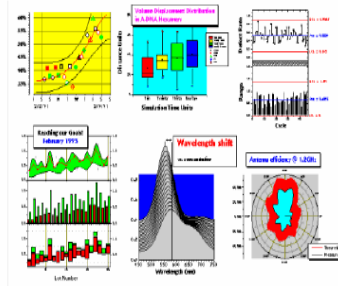
TGaxis is a typical case: it does the job, but the code is really clumsy and difficult to maintain. Many new extensions have been requested, but because of code clumsiness, they have not been done. The code is somehow blocked. Touching it often means introducing many unwanted side effects.

An other example is the TGraph painting: to paint an histogram we create an histogram which is then painted using the graph painting functions ... We can multiply the examples like that (some of them are listed here: http://couet.web.cern.ch/couet/POW_files/frame.htm).

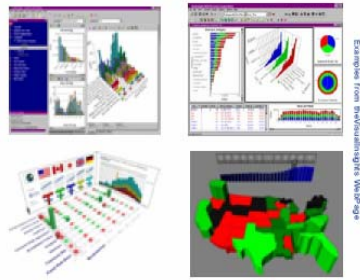
As said before, this sort of developments are not immediately seen by the end users and, as such, may not appear of high priority. But, for a long term project like ROOT, it is a major goal to have solid and easy to maintain basis.

- **OpenGL** should take more and more importance, for 3D graphics but also for 2D. We may end up with only OpenGL as low level graphics engine.
- Make wider use of image **processing techniques** like those provided by TASimage.

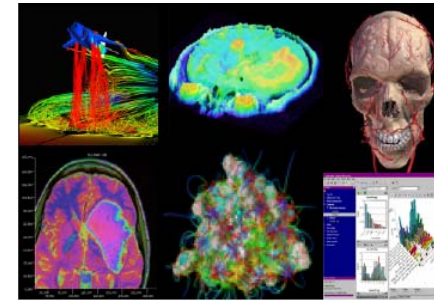
- Import **new techniques** to visualize data. We surely must take ideas from the Visualization experts (cf IEEE Vis Conference).



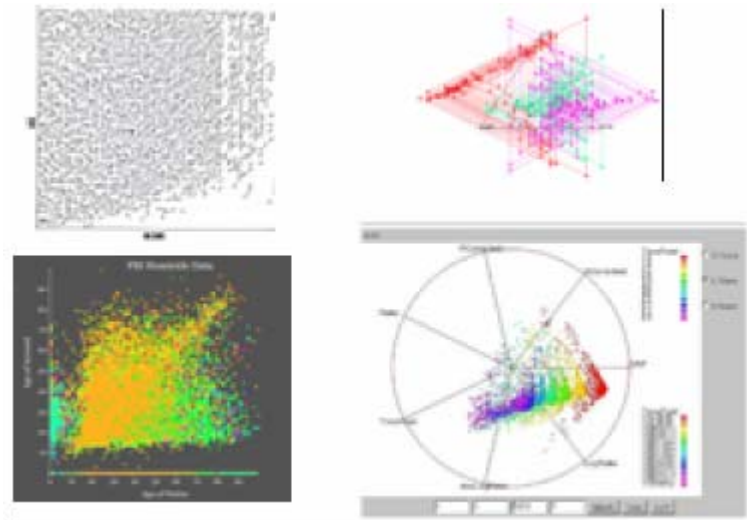
Classic Visualization Techniques



Standard 2D/3D Displays



Modern Visualization Techniques



Ultra Modern Visualization Techniques

New visualization techniques as those presented as “ultra modern” by visualization experts, in Viz-2004, need some prototyping and close work with users are required to find out if they can be useful in the HEP context.

Evolution of the ROOT project itself.

- Stability, reliability.
- User support : web site, tutorials, examples, FAQs, documentation.
- Do not miss new technologies, but as a mature project now needed to do real work, stability and reliability are more important.