**Visual Physics Analysis VISPA**

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**Analysis Designer**
- Use GUI to design analysis
- Multi-path analysis flows
- Build analyses combined from C++ and Python modules
- Interactive creation of modules

**The PXL Toolkit**
- C++ toolkit for high level physics analysis [3].
  - Has been developed since 2006
  - Version 2.1 (2009)
  - It is the successor of the PAX (Physics Analysis Expert) toolkit, which was developed from 2002 to 2007
  - PXL provides all necessary features for an experiment-independent high level physics analysis with emphasis on an easy user syntax

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**General Features of VISPA**
- Aim: support design, execution and verification of HEP analysis [1,2]
- Multi-purpose window
- Visualization of analysis data and analysis flow in one Graphical User Interface
- PXL C++ toolkit as an underlying analysis software

**Downloads and Literature**

**PXL Components**
- Event Container pxl::Event
  - Particles (pxl::Particle)
  - Vertices (pxl::Vertex)
  - Collisions (pxl::Collision)
  - User data (pxl::UserRecord)
  - Their relations and roles
- pxl::Event represents an entire physics event
- pxl::Event can hold several pxl::EventViews
- pxl::EventView is a special view of this event
- Copies of these classes preserve all contained information such as the relations between particles
- User Record pxl::UserRecord
  - All major PXL objects provide UserRecord for storage of arbitrary user data
- Input/Output System pxl::Serializable
  - Fast, flexible, small file size (uses ZLIB library)

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**Python Interface**
To enable the usage of all PXL objects and their methods within Python programs, a Python extension PyPXL is provided:
- Python code is easy to read
- Less code compared to C++
- Dynamic typing
- Automatic memory management

**Novel Concept of making physics analysis:**
- Combination of graphical and textual programming
- Module steering
- For application in any HEP experiment

**Run Analysis**
- Run analysis interactively:
  - Or export the analysis as XML or Python steering and run it on the laptop, desktop or GRID

**Autoprocess**
- In various physics analyses (Top, Higgs, SUSY) a reconstruction of the whole decay chain is needed
- Several possible configurations need to be built
- Autoprocess is a module for automated reconstruction of particle cascades [4]

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**Event Browser**
- Browsing physics data on an event-by-event basis
- Visualization of decay trees
- Inspecting properties of each object