

Visualization WG summary

A network visualization showing a cluster of white nodes connected by a dense web of yellow lines. The background is a dark blue, abstract 3D structure with a curved surface and a circular opening on the right side.

HSF Workshop San Diego
23-26 Jan 2017

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for the Visualization WG

Visualization WG summary

At yesterday's session:

- 10 people in the room + ~10 people remotely
- Live input from ALICE, ATLAS, CMS, ROOT + offline input from LHCb, GSI

Participants: Riccardo Maria Bianchi, Joe Boudreau, Thomas McCauley, Giulio Eulisse, Alja Mrak Tadel, Mark Neubauer, Alexander Sharmazanashvili, Matevz Tadel, Valho Tsulaia, Ilija Vukotic, Sandro Wenzel, [+ *other people remotely*]

plus offline input from: Laurent Chevalier, Edward Moyses, Jeremi Niedziela

Dedicated mailing list: <https://groups.google.com/d/forum/hsf-cwp-visualization>

WG charge document: <https://docs.google.com/document/d/1ZXiMMmmAj1lwQIuvDc2UM4Jx6-hh1iamlw79DXguLIM/>

WG Scope

Scope:

Visual representation of **event data** overlaid with **detector geometry** for the purpose of **HEP research, education and outreach**.

This representation can be static (**event displays**) or time-dependent (**animations**).

Out of scope:

- Visualization of detector infrastructure and systems (eg. slow control)
- Visualization for statistical data analysis (histograms, etc...)

Challenges

Challenges for the WG:

- Improve support for the following use cases:
 - **detector** design (geometry browser)
 - **simulation** and **reconstruction** development
 - physics **analysis**
 - **outreach & education**
- Support required **platforms** and **devices**
- Ensure sustainability for **key software packages**
- Improve low latency **access to data**, low entrance cost
- Improve **rendering** performance
- Improve **user interaction**

Questions

Questions the WG will address in the next 6 months:

- Can we have **common graphics engine**?
- Can we develop a **common framework** such that experiments can plug in geometry and event data in their own formats/data?
- Can the **data delivery** be web-based?
- Can we develop a **collaborative** (“*multi-player*”) **tool** to visualize and interact with event data and geometry in real time and a distributed manner (Google doc for visualization)? How will this capability advance **HEP research and education&outreach**?
- Can we think about common visualization tools with **other fields** (astrophysics, geophysics, etc...)? And/or can we **learn** something from them?

Interactions with other WGs

Topics for which we will have to interact with other WGs:

- Data access (data handling, frameworks)
 - Can we have a low-latency access to single events?

- Geometry description (simulation group)
 - Can we have a base common geometry description?

WG Work plan

Next 6 months:

- Identify topics for **sub-white-papers**
- **First workshop** in a couple of months (probably at CERN):
 - Review available graphics engines, make a shortlist
 - Show-off current event visualizations, as input for discussion about future tools
 - Write up drafts and deliverables

Future:

- A second workshop with demonstrators based on a shortlisted ideas & tools