

APPAVO

Augmented tools for Particle Physics Analysis, Visualisation and Outreach

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How will we be doing analysis in 10-15 years from now ?!

- ❑ I'm not here (overly) interested in adiabatic evolution
- ❑ Rather thinking out loud about *what could be the quantum leap*

Remember, just to set the scene:

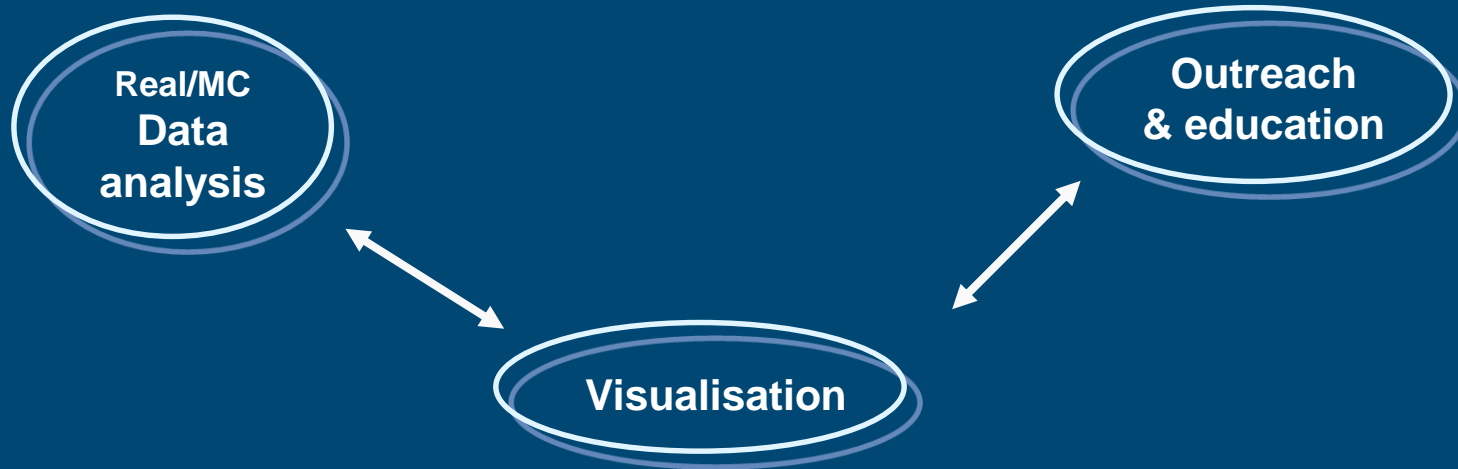
*(Not quite) a long time ago ... we did not
have laptops till the 80s
have wireless 802.11 protocol till the late 90s
work (actively) with laptops till mid 2000s
have CERN-wide WLAN till a few years later
work “anywhere” (includes meetings ;-)! before ~2010
work with VMs, clouds, ... before 2010s*

*Retrospectively, could we have imagined
such a timeline?*

*The future has its unknowns (great!) ...
... but we can shape it !*

A Particle Physicist's wish-list – APPAVO

- The landscape, very broadly (sic!) speaking:



- Daily work builds on adequate & complex software frameworks & stacks – a huge enterprise !
- Touching the 3 topics above, can we somehow
Enhance the analysis experience with very contemporary technologies ?
While making also *a large impact on the way we deliver in outreach & education ?*

Augmented tools for Particle Physics Analysis, Visualisation and Outreach !

Augmented tools for Outreach & Education

- ❑ **Obvious application of Augmented Reality (AR) techniques**

- ❑ Imagine an “App” on a device with a camera viewing a cavern and detector underground, exhibits of for example subdetector parts, maquettes at experiment halls ...
- ❑ AR can considerably enhance the experience, providing interactive menus, with, e.g.
 - Relevant information on cavern/experiment/detector
 - Animation of particles traversing subdetector, even using real data
 - ...
- ❑ The visit could even be made virtual (if recorded?), so with the visitor not physically down a pit
 - Great when no other way is possible

- ❑ **AR opens a new world here !**

Augmented tools for Visualisation

- ❑ Somewhat related to Outreach & Education tools to some extent
- ❑ AR works on images and movies
- ❑ These can be reality or products of simulation
- ❑ Indeed, in the end, it's all images/videos and one can superpose info on predefined "pieces" !
- ❑ Not quite AR so rather a kind of Augmented Virtuality (AV)? (Let's focus on ideas for now.)
- ❑ **Interactive and custom-tailored visualisation could be very useful for an analyst's work too**
 - The possibilities are probably "infinite"
 - Not just event display type of visualisation. Data visualisation/manipulation is central ...

Augmented tools for data Analysis

- ❑ Augmented tools are intelligent tools
- ❑ The **analysis framework would hint** at what can be done with some (part) of the data, which algorithms can be applied, what info can be accessed/retrieved, ...

- ❑ Augmented tools seem to tag along well with the idea of specifying what one wants to/can do rather than how one wants to do it, so with a declarative analysis/programming model

- ❑ Crazy and/or unrealistic ideas ?
- ❑ Remember how we were doing analysis in 1998 ...
- ❑ Worth a shot in my opinion !

- ❑ Do I know *precisely* where all this would take us ?
- ❑ Nope ... But fine, it's an R&D proposal after all !

Thank you for your attention

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