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Development of Web-Based Detector Display Application Tracer for ATLAS Experiment

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Nowadays, detector display software applications are playing an important role in particle physics experiments. There is a wide range of different requirements for the application, starting from Outreach's virtual reality and education, to representation of physical events for the analysis. Another important requirement, coming from users, is an easy way to access applications, which means no installation and compatibility with the majority of hardware and software platforms. The last important requirement is to let users have maximum interactions with detector components, events, and graphical user interface, through the visualised scenes. All these create the necessity to develop a special architecture of an application with a core part with common functionalities and multiple super-systems with user-specific requirements.
Good results bring browser-based applications with the implementation of a Web Graphics Library. However, they have substantial limitations for the visualisation of scenes with certain numbers of facets, do not support Boolean cuts and more. The main task here is to find an agreement between lots of requirements coming from users and engine limitations.
This paper presents the development of the WebGL/three.js based event display application - Tracer, for the ATLAS experiment.

I read the instructions

Secondary track (number)

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