

Web-based monitoring of large-scale data in scientific experiments

Huge quantities of information are produced by scientific experiments world wide. Data formats, underlying storage engines, and sampling rates are varying significantly. At the Institute for Data Processing and Electronics we develop a web-based visualization framework which handles multiple types of slow-control data and helps engineers and scientists to inspect device operation and examine the integrity and validity of the measurements. The framework is used in a wide area of applications ranging from fusions experiments, astroparticle physics, to meteorological systems.

State-of-the-art web browsers support a rich set of features to construct sophisticated interfaces using web technologies only. With introduction of WebGL it become possible to perform 3D visualization as well.

The student is expected to design and implement a new module for real-time monitoring. The main challenge is to visualize multi-dimensional data sets and arrays of sensors mapped to the 3D models. One example is shown in the image below where an array of temperature sensors was mapped to the model of KATRIN tank to visualize the temperature distribution.

Required Skills: JavaScript & PHP; knowledge of OpenGL/WebGL is a plus

Experience Gained: WebGL/WebGL, Data management in high energy physics experiments, Visualization of scientific data

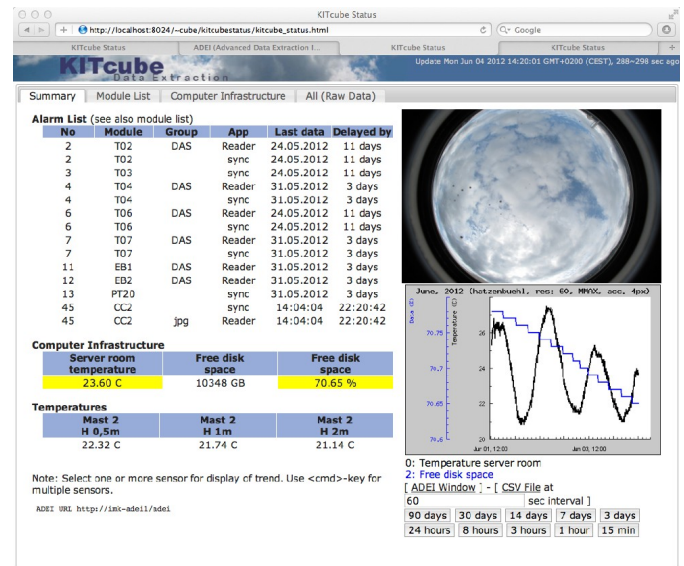
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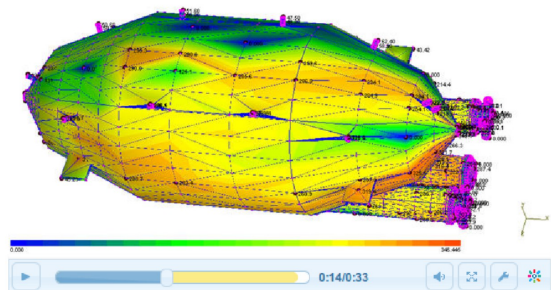
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Status display of a meteorological experiment



Heating profile of KATRIN tank