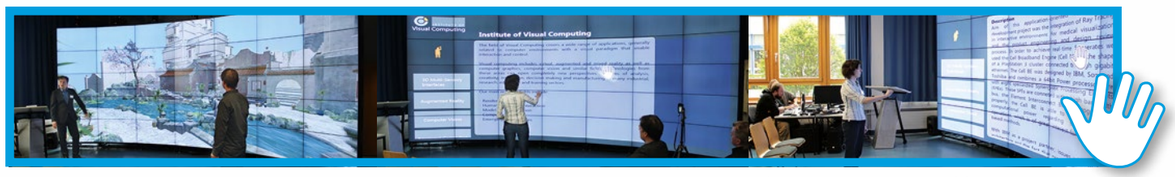
BIG DATA

HORNET VIDEO WALL WITH 72 MPIX ALLOWS BIG DATA VISUALIZATION

INSTALLED PRODUCTS

35× **46-inch ultra-super narrow bezel LCD displays type EYE-LCD-4600-M-USN-LD**

THE INSTITUTE OF VISUAL COMPUTING AT BONN-RHEIN-SIEG COLLEGE INSTALLS 20 M² VIDEO WALL FOR BIG DATA ANALYSIS WITH THE SUPPORT OF IMSYS IMMERSIVE SYSTEMS AS WELL AS EYEVIS AND PROGRAPHICS|ROLF HUWER CONSULTING



An Xbox Kinect camera enables gesture control.

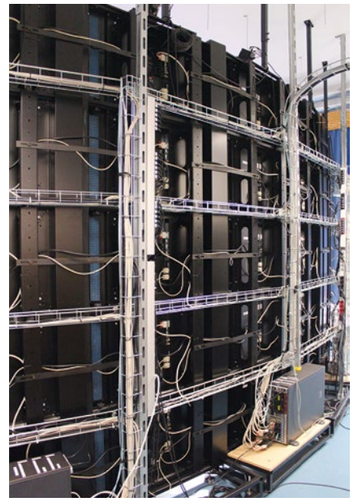
Processing, evaluation and analysis of "big data", meaning very large amounts of data, causes problems for companies and research facilities. The manual evaluation of the massive amounts of data, which often times only consist of numbers and formulas, quickly reaches its limits. A possibility to optimize manual evaluation is to visualize the data. For a useful visualization there is in many cases no medium that is able to display all data in a common context and allow for the analysis of small details at the same time.

For the visualization on smaller screens, the data mostly has to be highly compressed which makes detailed examinations impossible. To solve this problem, the Institute of Visual Computing at Bonn-Rhein-Sieg College in St. Augustin on 8 May 2014 with the HORNET put one of Germany's largest interactive and high-resolution display walls into operation. It consists of 35 seamless eyevis video wall LCDs of type EYE-LCD-4600-M-USN-LD with a complete resolution of 72 Megapixels, as well as an associated workstation-cluster.

The 35 eyevis displays with 46" screen diagonal, Full HD resolution (1.920 × 1.080 pixels) and high brightness of 700 cd/m² guarantee high-resolution visualization even for small viewing distances and thus a high level of detail for the visualizations. In molecular research for instance, the interaction of molecules at the lowest atomic level can be observed and evaluated during the development of new medications. When spectators take a few steps back from the wall, they are given a complete overview of the molecules on the 20 m² video wall without having to change the visualization. In this way coherences can be observed on a larger scale.

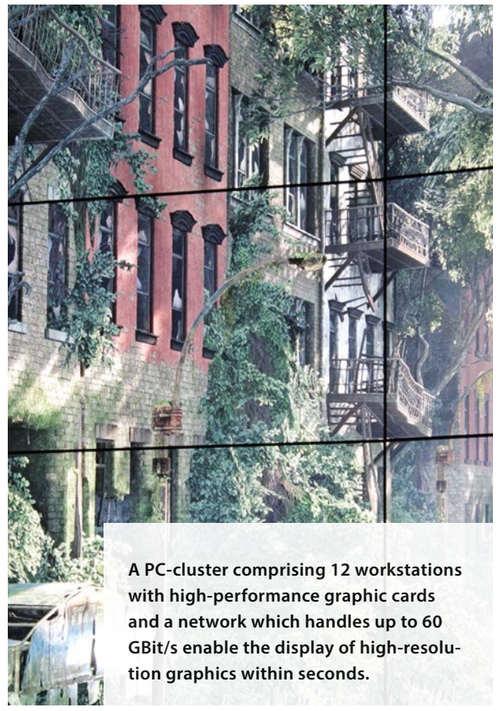
In order to allow for a useful visualization of big data, a fast conversion of the data into 3D graphics and their calculation in real time is also necessary. For that matter the institute relies on software based, interactive real time rendering of three-dimensional scenes and realistic rendering in high resolution for the visualization. To provide the required computing power for the visualization on the displays, the college together with Rolf Huwer Consulting configured three workstations with three graphic cards each and four Full HD connections per graphic card, which altogether output 35 Full HD signals. The synchronization of the 35 signals is software-based as well.

"For the visualization of complex results, however, the computing power is insufficient. To make full-scale visualizations of products like cars or industrial machines in high quality possible, the three computers are connected to a cluster of 12 more computers. These are equipped with three high-performance graphic cards each. They calculate the demanding graphics and send them to the three computers at the display wall. To achieve the necessary data transmission speed, we additionally set up a network with up to 60GBit/s transfer performance", Prof. Dr. André Hinkenjann, director of the Institute of Visual Computing, explains. Traditionally the image buildup of such high-resolution and high-quality graphics is conducted within minutes. With the HORNET installation this can be achieved in seconds.



3 workstations, each with 3 high-performance graphic cards, provide 35 Full HD signals for the playout on the video wall.

For a closer observation of the visualized data, the video wall moreover features different interactive control possibilities. An XBox-Kinect-camera allows for control of the wall through gestures. Seven tracking-cameras, which are additionally installed above the video wall, record users standing in front of the wall through a tracking system of ART – Advanced Realtime Tracking GmbH. The system registers the position and movements of the users in front of the wall. Thus, the visualization on the wall can for instance be controlled through hand gestures. For 3D visualizations on the monoscopic video wall, the system also adjusts the perspective of spatial contents to the position of the user. Displayed objects that are more distant move slower than closer objects due to the change of perspective. Through this effect, called movement parallax, the 3D impression is created for the user.



A PC-cluster comprising 12 workstations with high-performance graphic cards and a network which handles up to 60 GBit/s enable the display of high-resolution graphics within seconds.