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FRAUNHOFER INSTITUTE FOR OPEN COMMUNICATION SYSTEMS FOKUS

**SUCCESS STORY:
DESKTOP WARPING**



DESKTOP WARPING: CONSOLIDATED INFORMATION IN THE MULTIMEDIA CONTROL ROOM

The largest offshore drilling platform in the world is situated on Norway's coast: the natural gas-producing giant Sea Troll is 472 meters high. Platforms like Sea Troll yield important resources such as mineral oil and natural gas as well as new research results and meteorological data. However, the past has shown several times that accidents on rigs can result in severe environmental catastrophes. Safety and the prevention of accidents thus have the highest priority, which is why the rigs constantly have to be extensively and scrupulously monitored from the mainland. Engineers in so-called control rooms on land keep the processes offshore under surveillance. This overview can be maintained even better using modern media technologies, whereby information about the rig is visualized and displayed to the engineer in such a way that it encompasses her and virtually places her in the center of events.

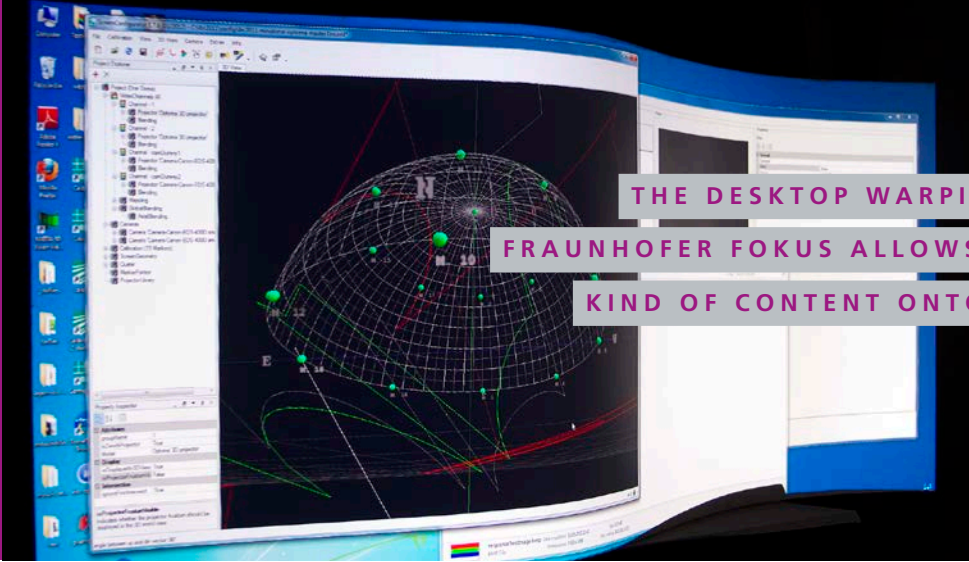
COMPLEX PROJECTIONS SEAMLESSLY DISPLAYED

Such scenarios are frequently realized by combining several clustered projectors that project the media content onto geometrically complex surfaces such as panorama screens or dome cinemas. The individual projector images here have to be rapidly coordinated with one another to give a single homogenous picture that seamlessly fills the surface. For this reason, the VISCOM Competence Center at Fraunhofer FOKUS has developed an automatic calibration software, which automatically calculates the necessary rectification of geometry (warping) and adjustment of luminosity (blending), so that the image is adapted according to the projection surface. The result is a uniform, seamless, high-resolution picture. "The technology definitely provides added value", states Jörg Krall, Business Development Manager of NVIDIA. "At the IBC 2012 in Amsterdam, I've seen VISCOM's solution and found it impressive. The calibration was accelerated considerably: instead of a half hour it only took about a

minute." However, the FOKUS media player with its automatic calibration feature is suited only for specific media content. Usually, when any kind of desktop content from different computer programs is to be displayed on a projection surface, an additional computer with a capture card or a so-called warping box has to be interposed between the graphic board and the projector. This process leads to a delay in content display. Furthermore, it often requires that specialized software be connected to the program to be projected, which is why users often cannot adapt their own content themselves.

DESKTOP WARPING DIRECTLY ON THE GRAPHIC BOARD

For this reason, VISCOM has developed a method for desktop warping in cooperation with the graphic board manufacturer NVIDIA, with which the warping and blending of desktop content for projection take place directly in the driver unit of the high-capacity graphic board. Some models from the NVIDIA graphic board series "Quadro" for professional applications have been providing an interface for desktop warping in their driver units for about a year. This feature is integrated directly into the hardware as an application programming interface (API). VISCOM has developed its desktop warping software to be suited to this interface, and has integrated it there. The advantage: everything that is processed on the graphic board (e. g. system software, any programs) can be directly adapted to and projected onto an uneven surface. Users can thus calibrate their content without a specific media player or others kinds of special software. Because no "third party" software or hardware is needed here, the output of content is faster and takes place without a delay. Even with PC and camera clusters, like they are being used in complex simulators and control rooms, the method functions in real-time without difficulty.



THE DESKTOP WARPING SOFTWARE FROM
FRAUNHOFER FOKUS ALLOWS IT TO PROJECT ALL
KIND OF CONTENT ONTO UNEVEN SURFACES

FOKUS AND NVIDIA: “TECHNOLOGICALLY EVERYTHING HAS WORKED VERY WELL”

Jörg Krall says, “We know that VISCOM has a lot of experience with this kind of technology – that is why we made our non-public interface available to its researchers. The Competence Center has had this know-how for a long time.” The cooperation for implementing desktop warping took about half a year. “The collaboration went very well”, FOKUS project leader Ivo Hausen sums up. “We are very glad about the support we have received from NVIDIA.” Customers can now, when they use a Quadro graphic board for their application purposes, additionally license the desktop warping technology from Fraunhofer FOKUS, thus adapt their desktop content to any projection surface in real-time, and display it on there. “With VISCOM’s technology, desktop warping is now possible faster, more easily and more transparently for all applications – and not just for those that are linked to special software”, Ivo Hausen assesses. Also Jörg Krall is content with the cooperation: “Everything was uncomplicated and has worked very well technologically.”

MAINTENANCE SYSTEMS IN THE OIL INDUSTRY WITH SCOPOS AND ITECSOLUTIONS

The NVIDIA graphic board with the desktop warping technology from Fraunhofer FOKUS is already in practice in several cases. An example is the Norwegian company Scopos, which develops camera technologies and software solutions for the production and visual processing of HD video content, for example in tourism, the petroleum and the gas industry. Scopos has already been using VISCOM’s automatic calibration

software for their customers with the help of capture cards for a while. Grethe Hindersland, General Manager of Scopos, sums up the cooperation with VISCOM: “We have been close with Fraunhofer FOKUS’ team around Ivo Hausen since 2007. We always get very good answers to our questions and products we have bought hold a very high standard.”

THE MULTIMEDIA CONTROL ROOM: VISUALIZE INFORMATION INSTEAD OF LOOKING IT UP

Now Scopos is using VISCOM’s desktop warping technology to enable a concrete application scenario for their customer iTecSolutions. The company uses desktop warping to display the maintenance systems of oil-producing rigs for their customers from the oil industry. The technology allows several employees in the control room to work together from different computers on one screen, and to keep a check on one another, which contributes substantially to quality assurance and thus to safety. In addition, iTecSolutions researches how desktop warping can be used for the visualization of maintenance systems. Should problems occur on an offshore oil rig, normally the relevant information has to be researched tediously on a computer in order to be able to efficiently solve the problem. With the help of desktop warping, information from different sources about the platform and about occurring problems or risks is to be visualized on a screen, thus giving a coherent overall picture of the maintenance system. Svein Krossli, Manager of iTecSolutions, thinks: “The desktop warping technology is well suited for the application purpose at our company. I am very satisfied with it.”



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