

# Innovative IT for the Technological Leadership of the Maritime Industry

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## Virtual Design Review

The machinery room of a modern ship is heavily loaded with the main engine, supporting modules, pipes and cable harnesses. However, the shipyard is responsible for the manufacturability of the layout and has to ensure an ease of maintenance over the whole life cycle. This is a highly interdisciplinary approach with the involvement of various partners.

By means of Virtual Reality technology, the team can easily review and interactively optimize the solution developed in the CAD system. The design review application of ZGDV Rostock is tailored to the needs of the maritime industry, for example by integrating with the popular TRIBON design system. An additional feature is the conferencing, where two or more applications (VR and/or desktop applications) can be connected for distributed design review. The system

is based on AVALON, a joint platform of ZGDV and Fraunhofer IGD for advanced virtual as well as for Augmented Reality solutions.

## InVIS Workshop

»Integrated Virtual Shipbuilding«, the first workshop organized by ZGDV's ProVR Forum in Rostock, gave a comprehensive overview of state of the art in Virtual Reality and simulation applications in shipbuilding. With more than 30 participants from industry and the research community, the workshop was a good opportunity to share experiences and exchange ideas about upcoming technologies and application areas in this industrial sector.

The first part of the workshop was dedicated to the results of the InVIS project funded by the German Federal Ministry of Research and Education. The project partners from Ros-

## German Abstract

Die maritime Industrie und insbesondere auch der Schiffbau sind High-Tech-Branchen, die unter Nutzung neuartiger Materialien, Entwurfs- und Fertigungsverfahren Produkte für einen internationalen Markt produzieren. Höchste Anforderungen an die Wirtschaftlichkeit und die Sicherheit auf See sind ständige Innovationstreiber.

Der Beitrag beschreibt neben den aktuellen Lösungen auch Aktivitäten des ZGDV sowie des ProVR-Forums in Rostock, die darauf abzielen, Technologien wie Virtuelle und Erweiterte Realität für die Anforderungen der Branchen anzupassen und zu verbreiten.

So stellte der in Rostock abgehaltene InVIS-Workshop Ergebnisse aus einem kürzlich abgeschlossenen BMBF-Projekt vor und stellte sie zusammen mit Ergebnissen weiterer Forschergruppen und innovativen IT-Produkten zur Diskussion.

Auf europäischer Ebene widmete sich der erste Europäische Schiffbautag in Brüssel dem Thema Innovation. Unter den verschiedenen Beiträgen präsentierte das ZGDV in Rostock Lösungen zum virtuellen Schiffbau.

Der Artikel schließt mit einer Vorstellung aktueller Initiativen, die auf weitere IT-gestützte Innovationen für die maritime Industrie ausgerichtet sind.



Figure 1: ZGDV's design review solution based on AVALON.

tock, Wismar and Berlin presented their solutions – ranging from virtual design review to data models and integration up to a fluid simulator and process descriptions.

In the second part, commercial solution providers as well as other research groups presented their products and visions in virtual shipbuilding. In the final discussion, the participants were able to compare the various approaches and got good insight into this challenging application area of computer graphics.

### European Shipbuilding Day

The maritime industry – the most important industrial sector in Mecklenburg-Western Pomerania – is often perceived as low-tech and as having old-fashioned materials, design tools and production.

The objective of the first European Shipbuilding Day 2006 held in the Committee of the Regions in Brussels was to change this image and inform politicians and lobbyists about the high-tech nature of shipbuilding. Dr. Uwe von Lukas, associate director of ZGDV in Rostock, was invited to present the concept of virtual shipbuilding. His presentation was accompanied by a live demonstration of a Virtual Reality application. There, the participants could gain their first experiences in an immersive walk-through of a container vessel.

### Outlook

Based on recent results, there are various activities to introduce additional technologies in co-operation with our industry partners, especially in the shipbuilding industry.

One idea is aiming for a flexible Virtual Reality toolbox, including application as well as integration modules, combined with accompanying service concepts. The end user will benefit from massive reduction of implementation costs for custom-made VR applications, such as specific assembly and disassembly operations.

Another concept will support the product innovation of the maritime supplier industry. Supported by simulation, it will be possible to evaluate and optimize a product (for example its usability, behavior in critical situa-



Figure 2: Guido Schulte of Aker Yards Germany during his presentation at the InViS Workshop.



Figure 3: Virtual Reality experience at the European Shipbuilding Day 2006 in Brussels.

tions and integration into the environment). In this area, we have to find an optimized solution to the continuum between Virtual and Augmented Reality.

The challenge of simulated reality is very attractive to the stakeholders of our regional maritime industry.

From the computer graphics perspective, we have to deal with advanced visualization and interaction functionalities in the context of the 3D product or product model –

far beyond today's 2D charts. In this area the ProVR forum Rostock is currently bundling expertise from research and industry – as well as integrating experienced players from the aerospace industry.

### Point of Contact

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