MARITIME GRAPHICS:
A EUROPEAN PERSPECTIVE TO CHALLENGES AND SOLUTIONS

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Outline

- Fraunhofer IGD
- Trends & Challenges
- Research Results
- Technical Aspects
- Summary

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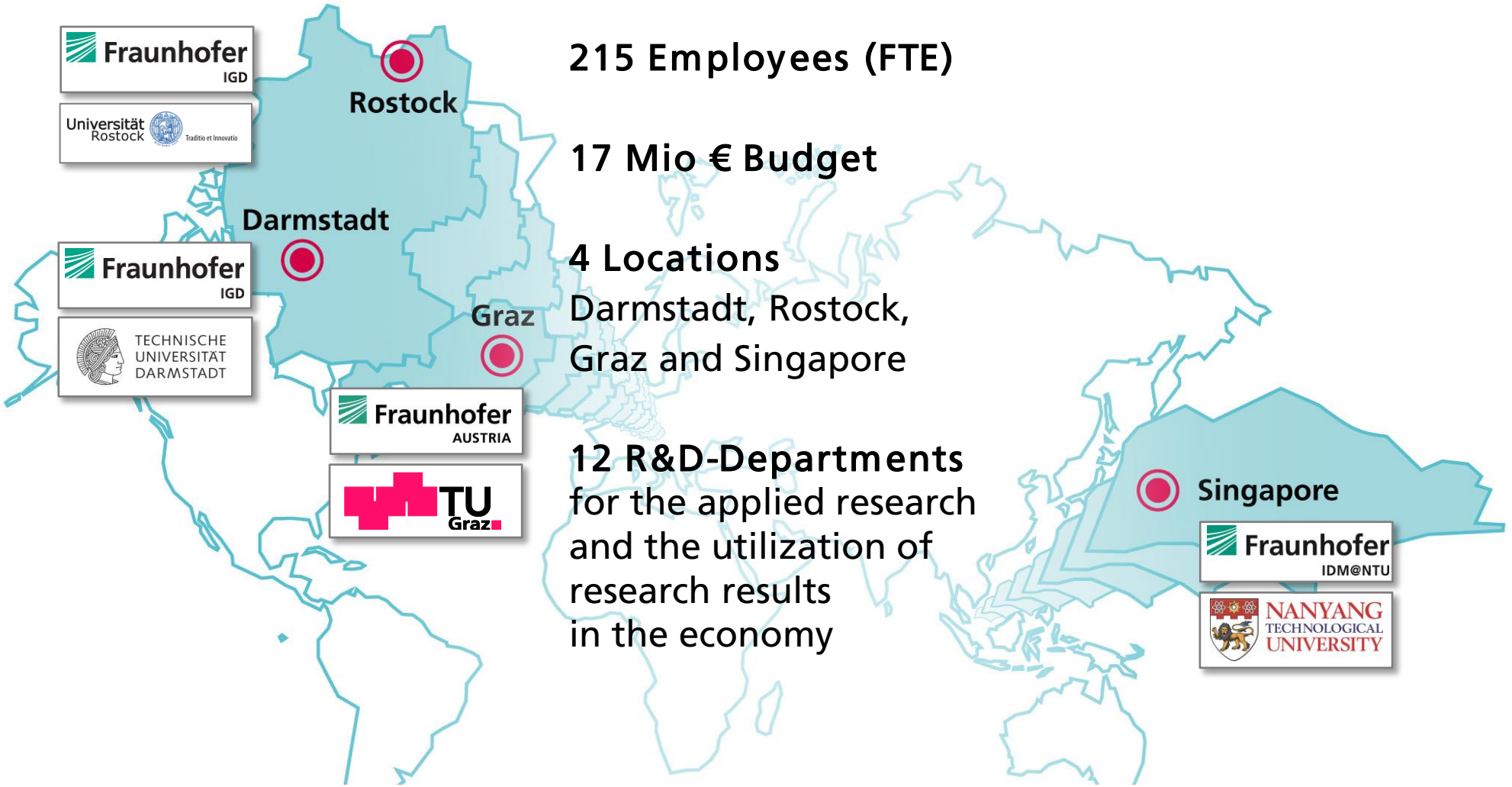
Fraunhofer IGD (as of 2012)



215 Employees (FTE)

17 Mio € Budget

4 Locations
Darmstadt, Rostock,
Graz and Singapore

12 R&D-Departments
for the applied research
and the utilization of
research results
in the economy

The world's leading institute for applied research in Visual Computing

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FRAUNHOFER IGD BUSINESS AREAS

Visual

Visual
Decision Support

Virtual Engineering

Virtual

Digital

Digital Society

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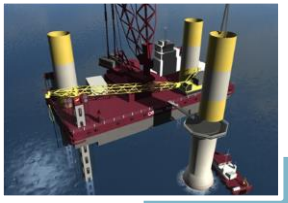
Maritime Graphics @ Fraunhofer IGD – Market Overview

Shipbuilding

- Shipyards
- Suppliers
- Engineering Service Providers
- Classification societies
- Hydrodynamic research

Shipping

- Ship owners
- Training centers
- Inspectors and authorities
- After sales services
- Pilots



Marine Technology

- Offshore companies
- Marine researchers
- Maritime mining
- Environmental protection
- Hydrographic authorities

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What's driving our customers?

1. *Safe, Sustainable and Efficient Waterborne Transport*
2. *A competitive European Waterborne Industry*
3. *Managing and facilitating the growth in transport volumes and the changes in trade patterns*

www.waterborne-tp.org

- Green ship
- Safe operation
- High quality products
- Competetive pricing
- In time delivery
- Integrating hightech systems

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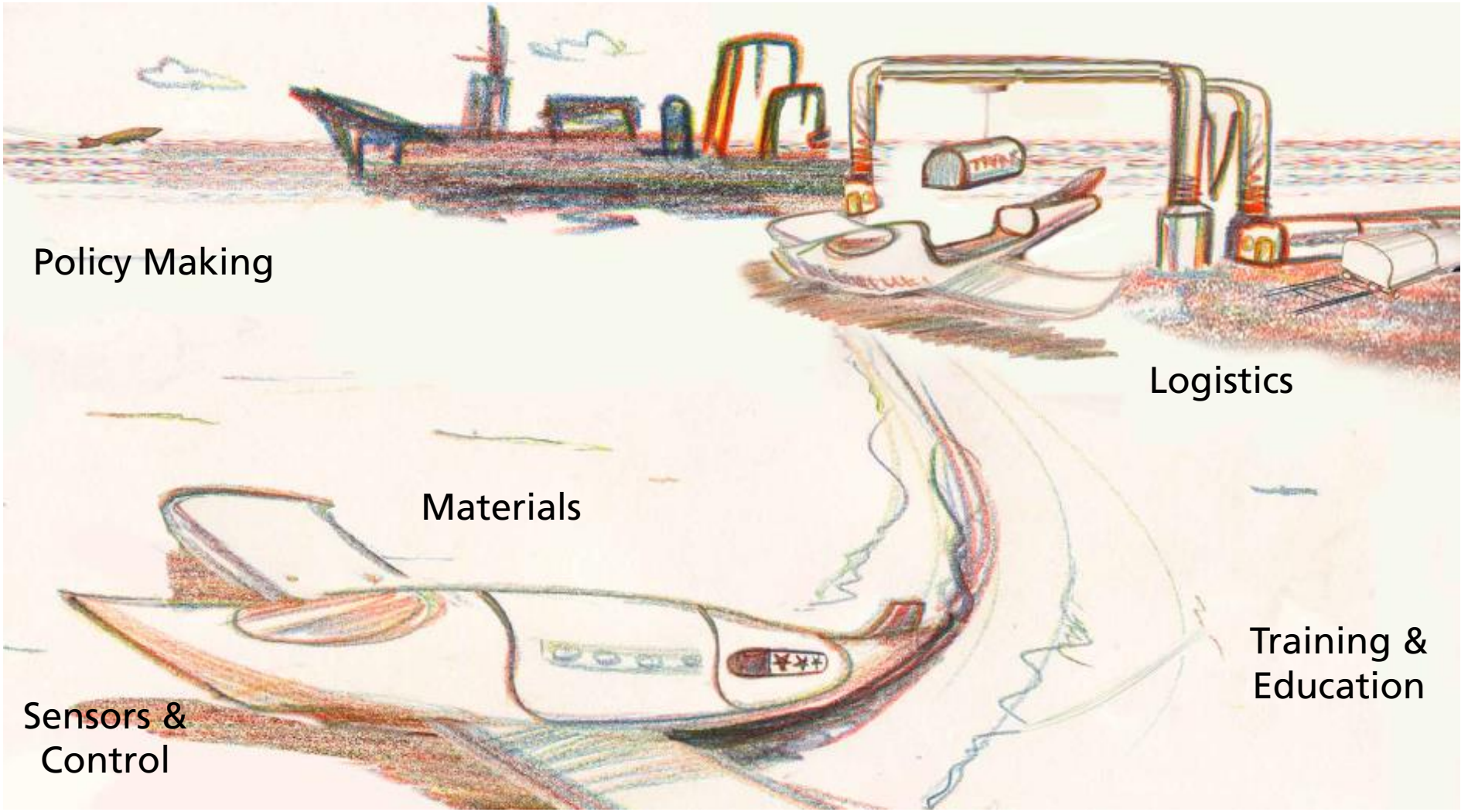
Waterborne Express 2030



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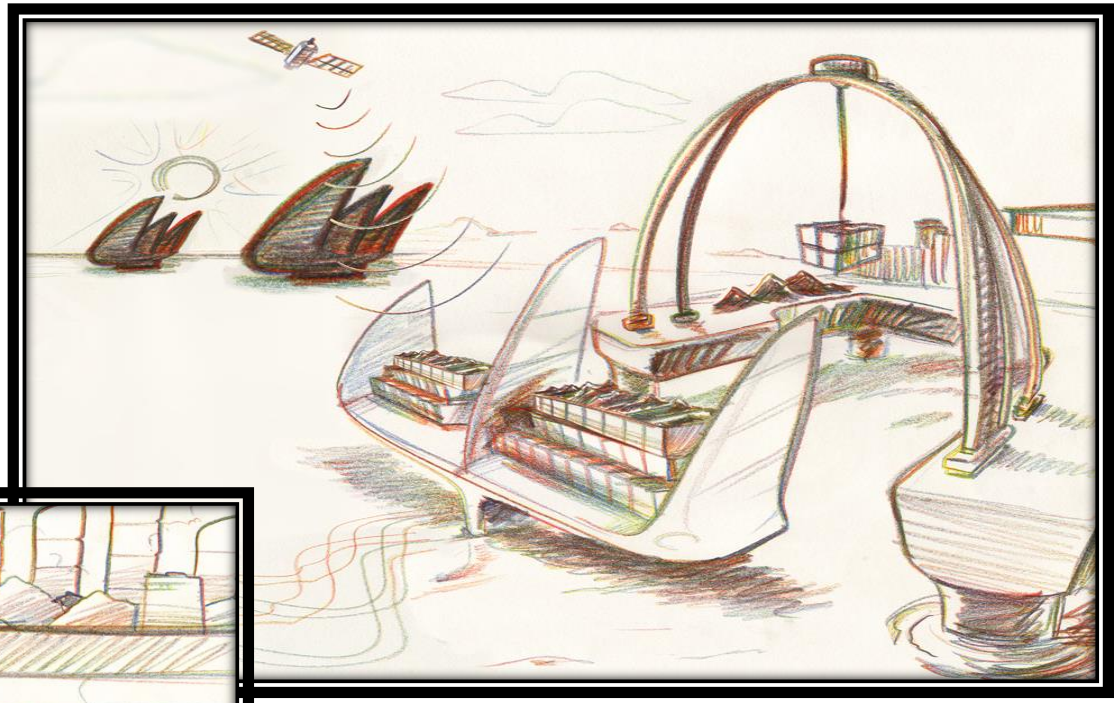

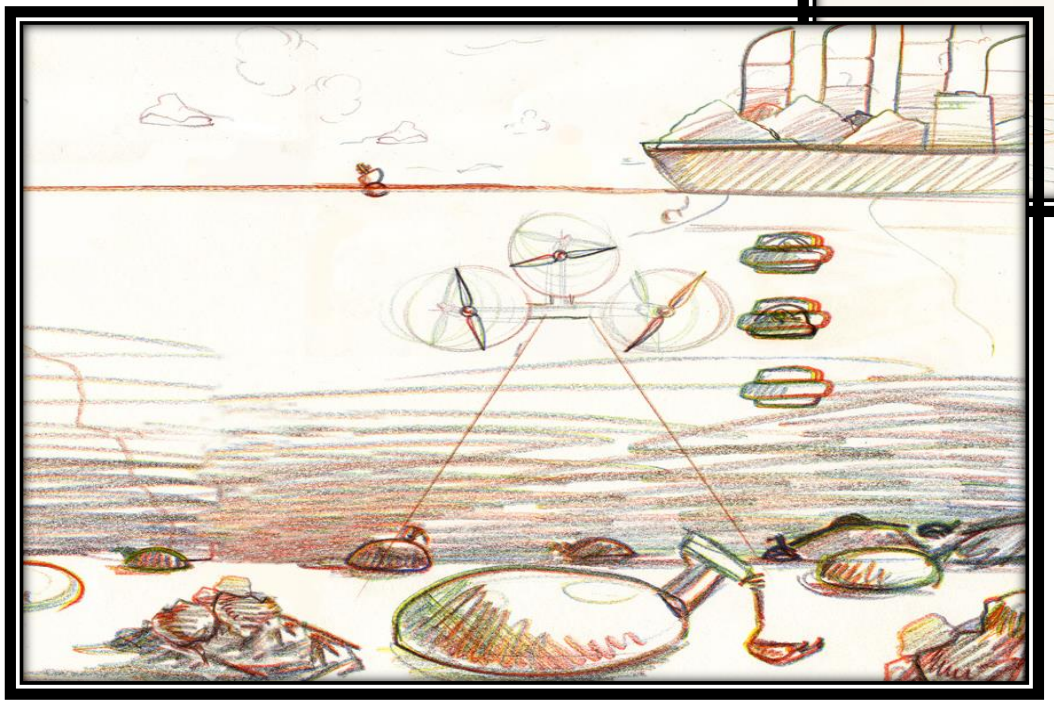

Maritime Mining Factory

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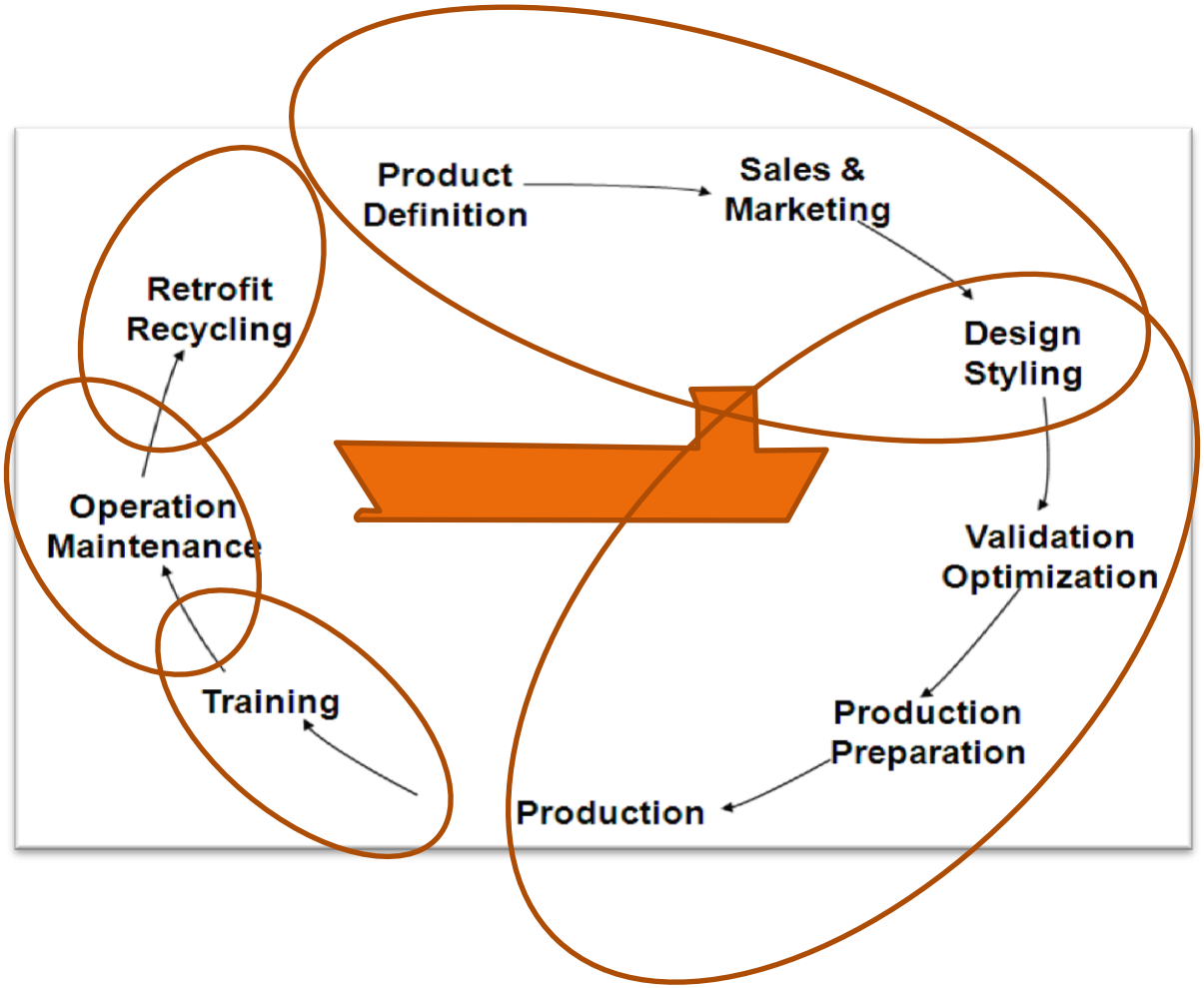
Trends for 3D/visualization

- Visualize data in context
  - Augmented Reality
  - 3D reconstruction
  - Large (heterogeneous) models
- Functional prototypes
  - interactive Visualization + realtime Simulation
  - Need for efficient authoring
- 3D in downstream processes
  - visualization format instead of CAD data
  - Natural interaction
- Flexible solutions
  - Scalable platforms (VR/desktop/mobile)
  - Combine data and specific GUI

Challenges for 3D Graphics in the (European) Maritime Industry

- Data complexity
  - A ship has 10 times more parts than a plane
  - Extremely heterogeneous formats
- Processe & organisation
  - SMEs
  - Parallel design & manufacturing
- Managing 3D Data over the lifecycle
  - Isolated data bases
  - Lack of awareness



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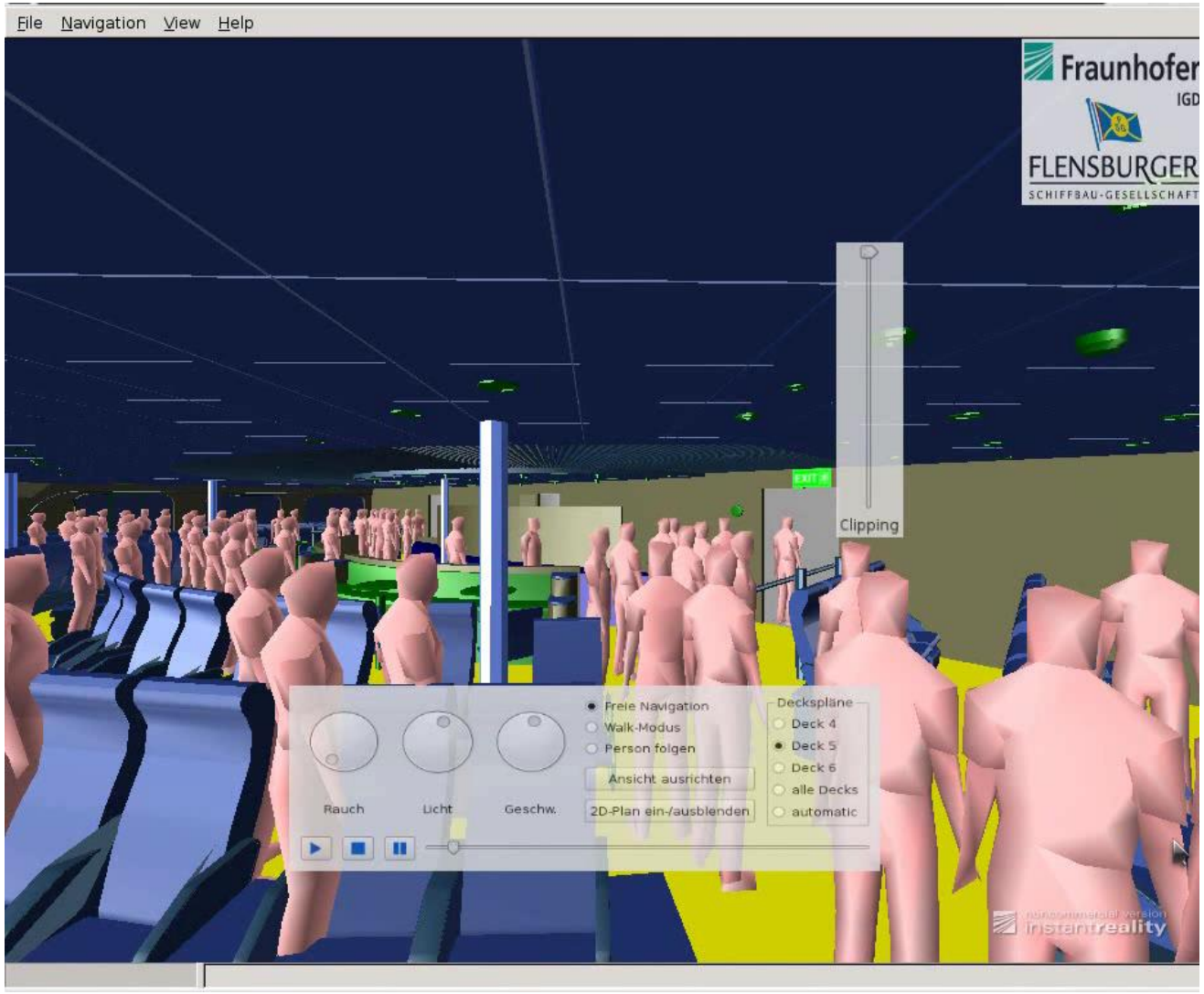
Safety Review in Virtual Reality



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Offshore Terminal

Fraunhofer
IGD

AR-based Pipe Design

http://www.youtube.com/watch?v=HJIbcIYWiVc

Quelle: Fraunhofer IGD/HDW

Virtual Training Environment

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eNavigation

Source: Fraunhofer IGD/Signalis

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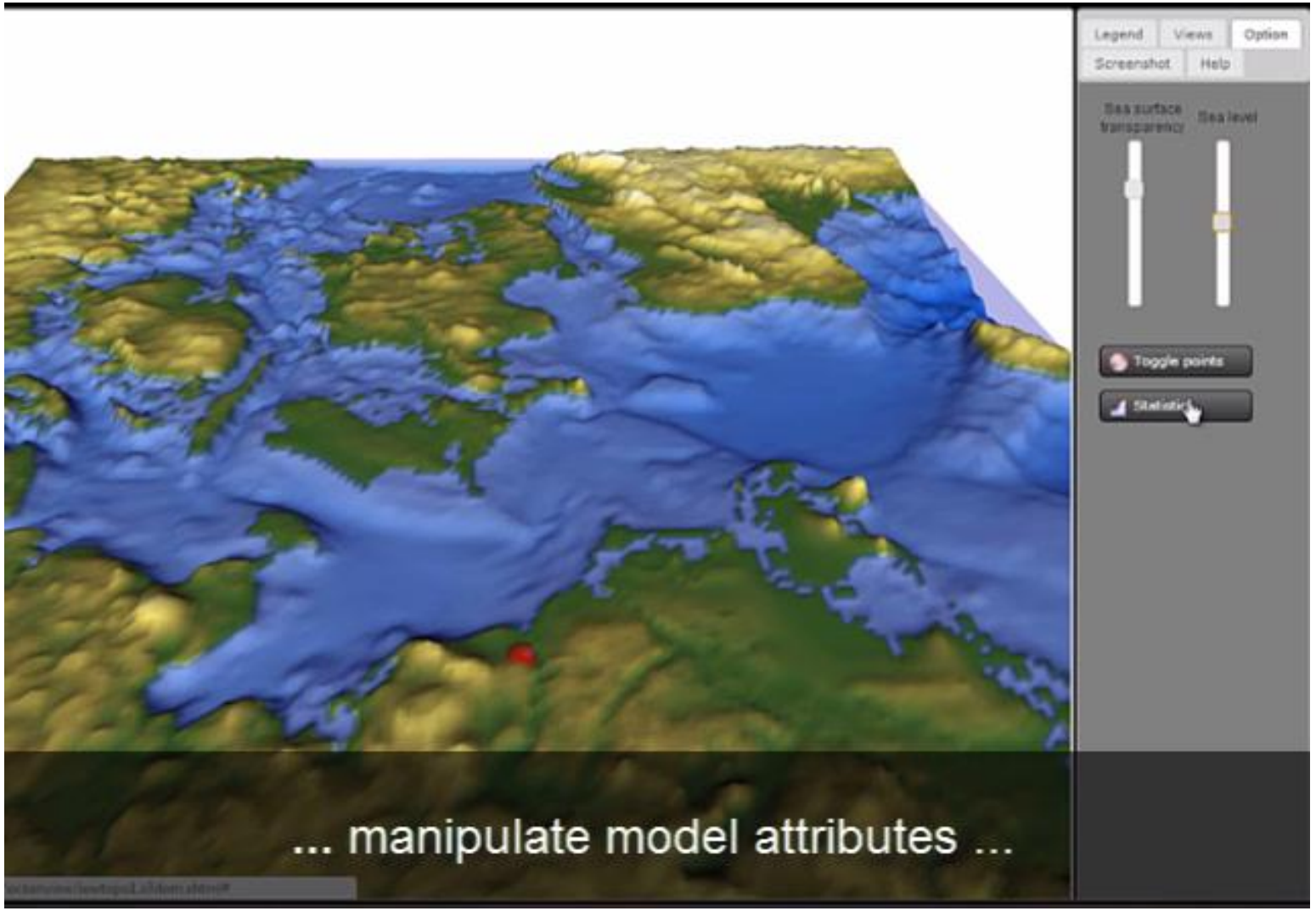
OcenView

www.youtube.com/watch?v=Vn7JxJP0WpI



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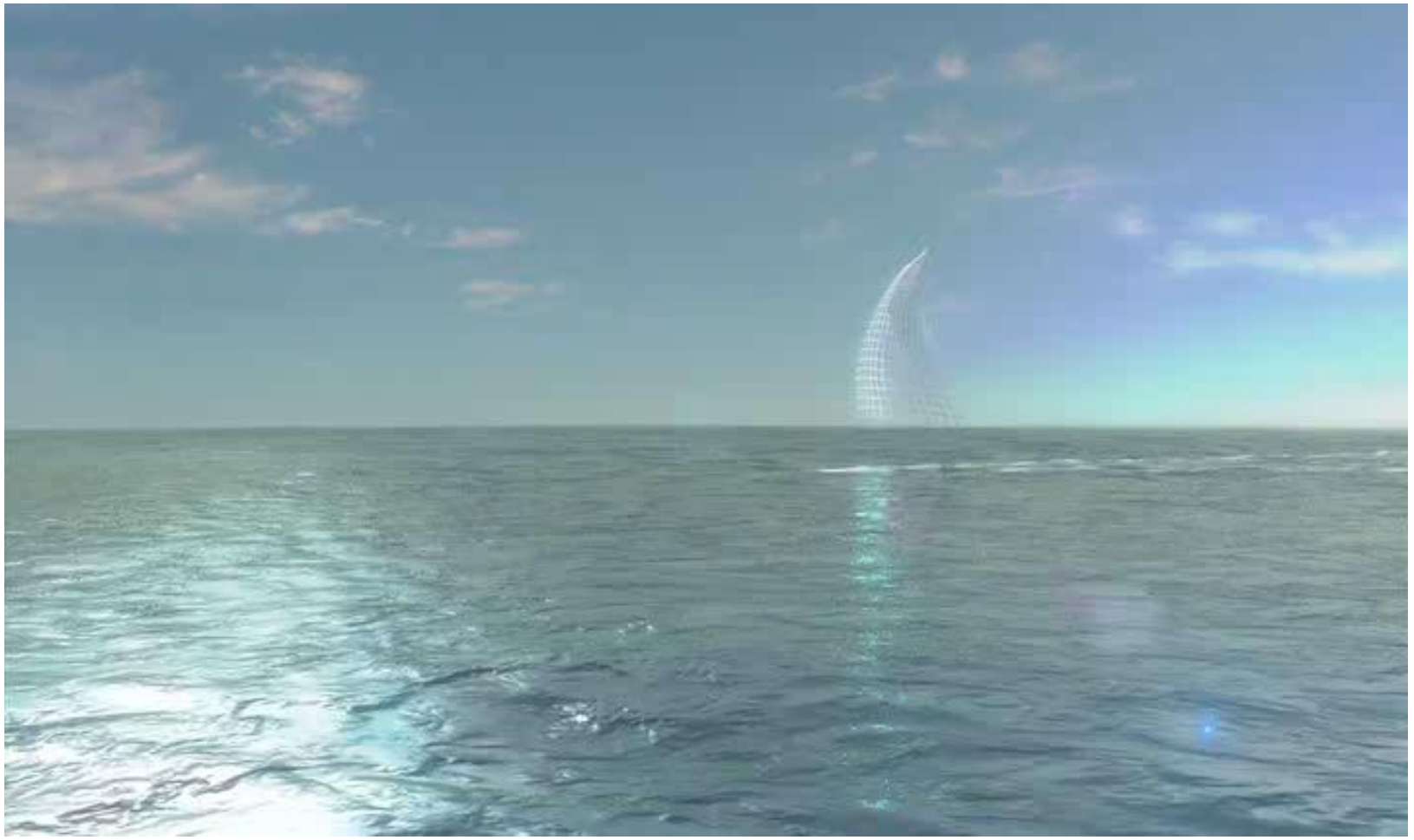
Vision: Virtual Ship 2017

http://www.youtube.com/watch?v=5OpVbk4wBak



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Working with 3D Data

- CAD
- Laserscan
- 3D Reconstruction

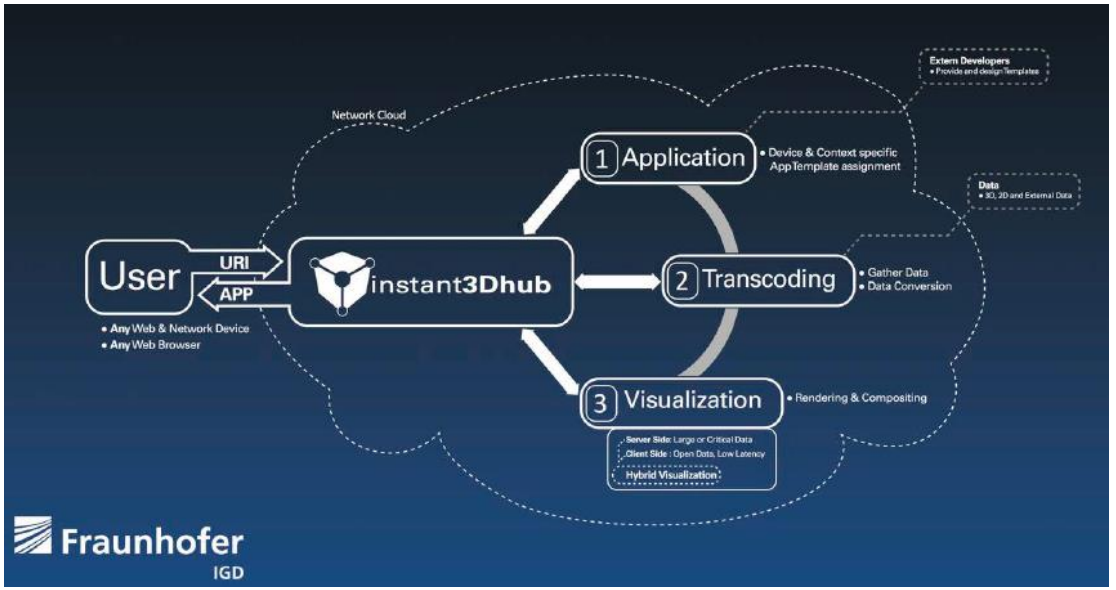
- Coding/Storage
- IP Protection
- Simulation

- Stereo Display
- Additive Manufacturing
- Gesture-based Interaction

Under the hood

- Authoring tools for interactive 3D
- Robust markerless tracking
- Declarative 3D for the web/cloud (X3DOM)
- …

- Interdisciplinary research
- Technology networks
  - Research
  - IT companies
  - Shipyards & suppliers
  - Shipping companies
  - Classification society



Summary

- The European maritime sector offers premium products
- They need hightech solutions to do their business well
- Visual computing serves the whole lifecycle of a ship from design over operation to retrofit
- Current research topics
  - Scalable visualization applications
  - Efficient authoring (based on CAD data, integrating simulation/interaction)
  - Handling large data sets
  - Fusion of real world and virtual world
- Fraunhofer IDM Centre@*NTU* is your access point for Fraunhofer's interdicplinary research pool

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THANK YOU FOR YOUR ATTENTION!