INNOVARE

Advances in Modeling & Simulation for Training

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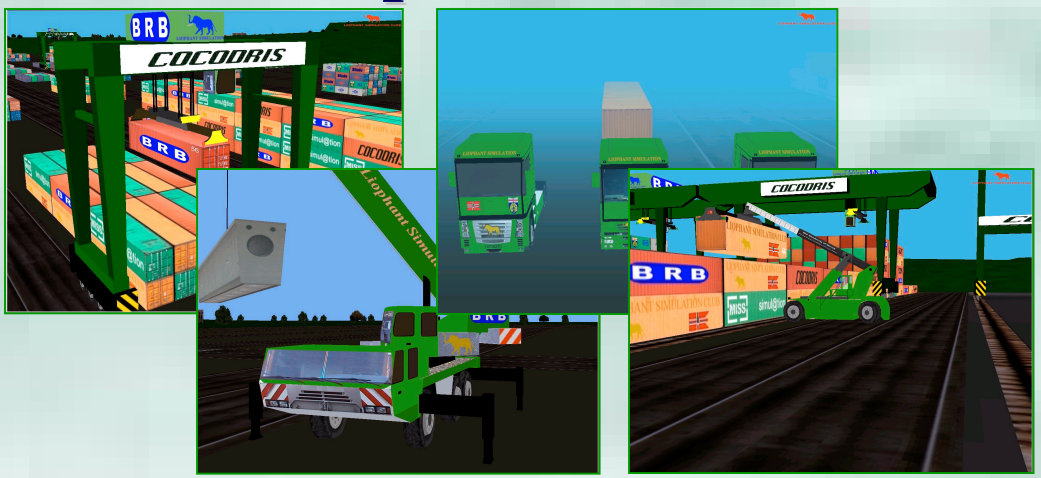
Driving Simulators

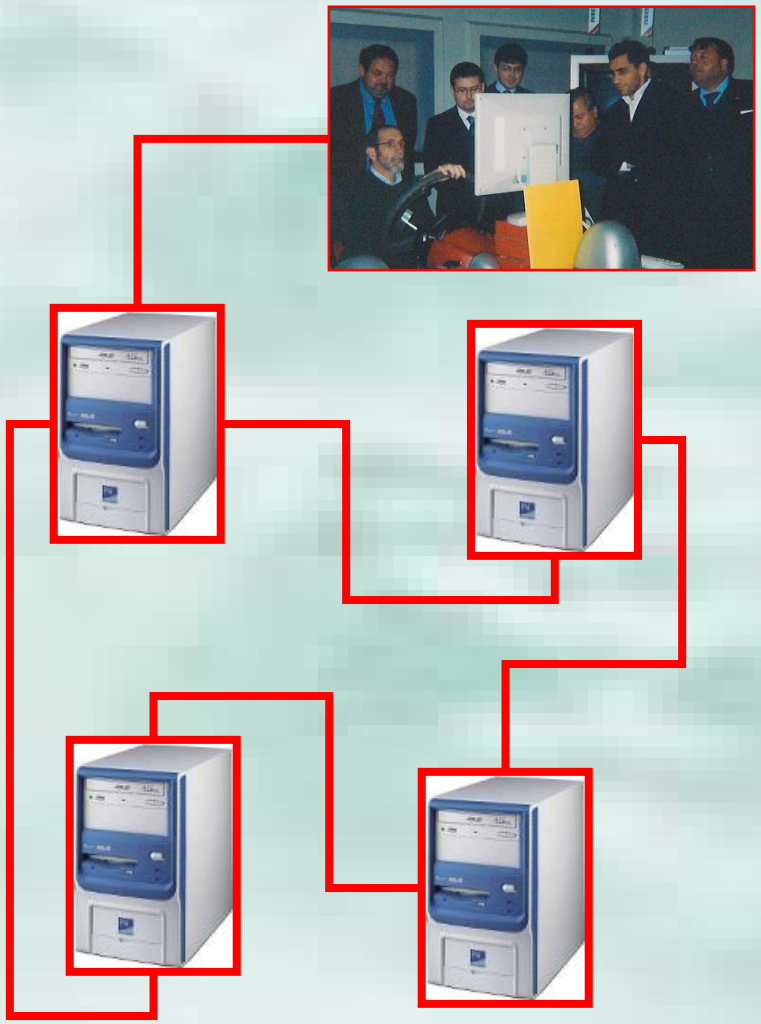
Driving Simulators requires today the development of different equipment based on most advanced technologies (HLA, Cocodris Engine, etc). Currently simulators was devoted to reproduce:

- **Transtainers**
- **ReachStacker**
- **Mobile Cranes**
- **Trucks**



HLA Integration

HLA integration allows to create interactive real time simulation across a network



HLA Cooperation

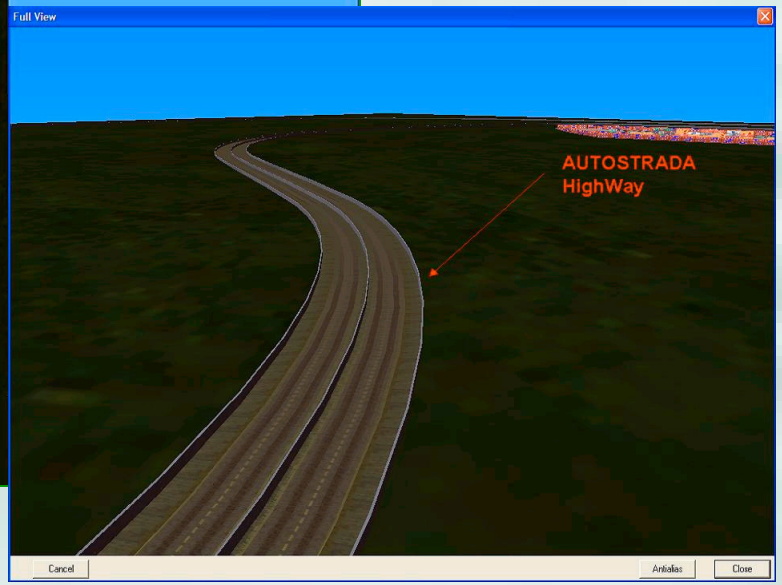
HLA integration allows to test container exchange between Cocodris virtual trucks and Cocodris virtual crane over different scenarios. In Innovare project this approach is extensively validated and used

HLA High Level Architecture Standard DMSO, DoD USA

General Layout

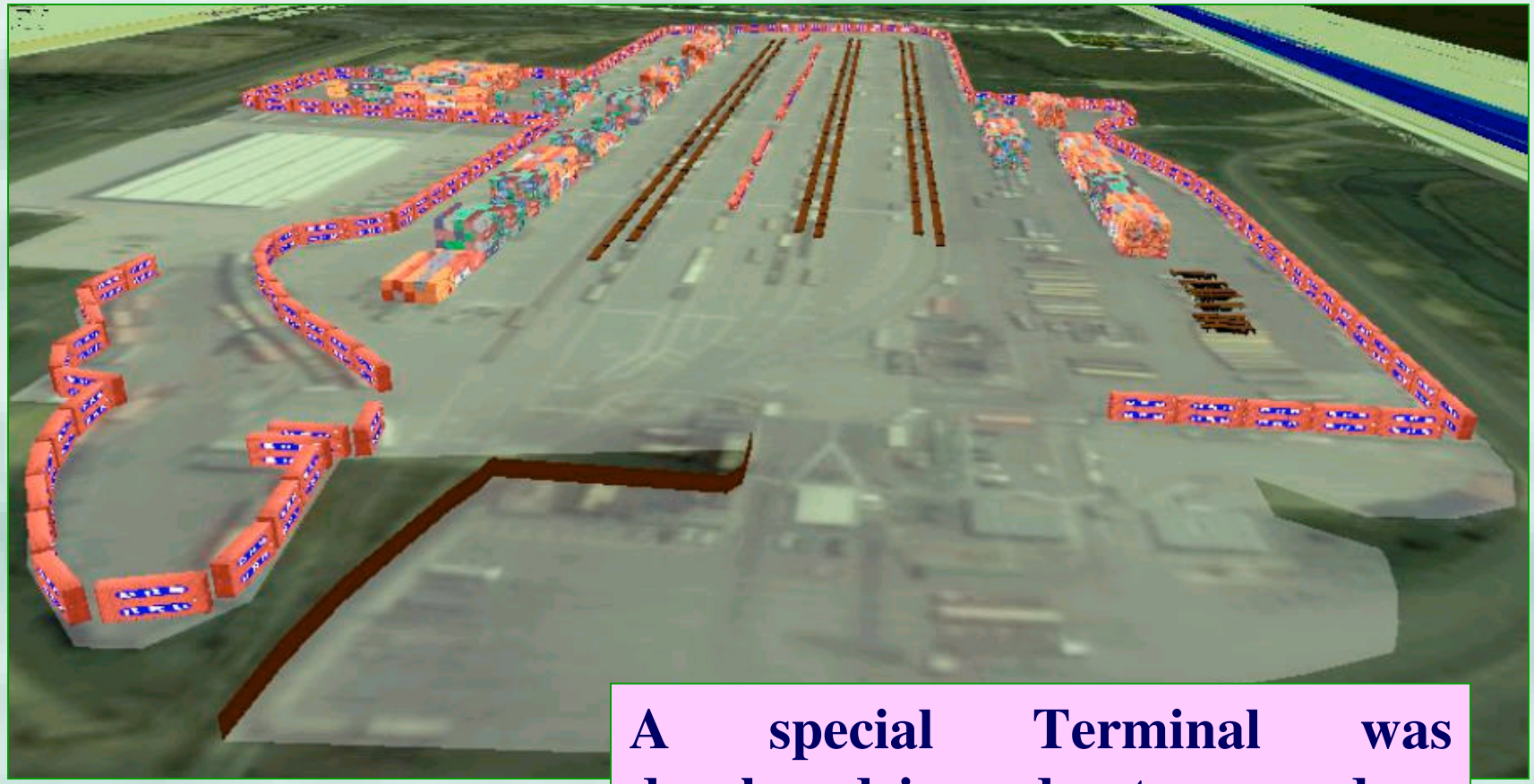
Innovare Terminal is integrated in a wide Virtual World

HighWay Path



Innovare includes an Highpath for truck driver training

Innovare Terminal



A special Terminal was developed in order to reproduce a "Novara Like" Scenario

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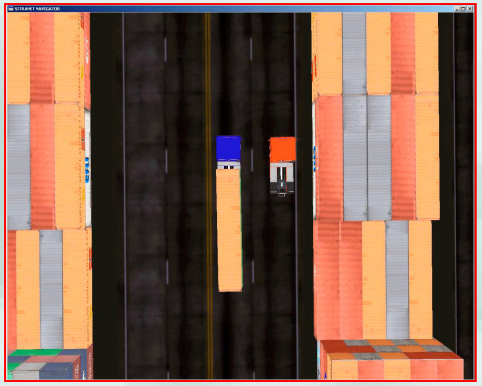
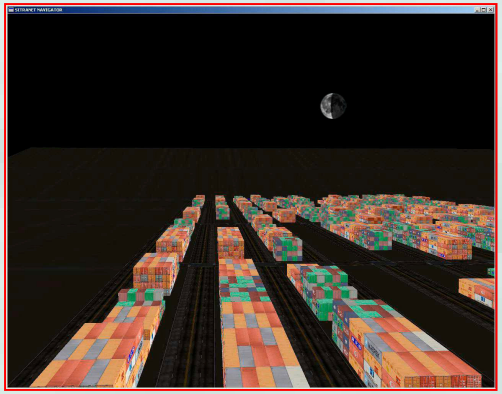
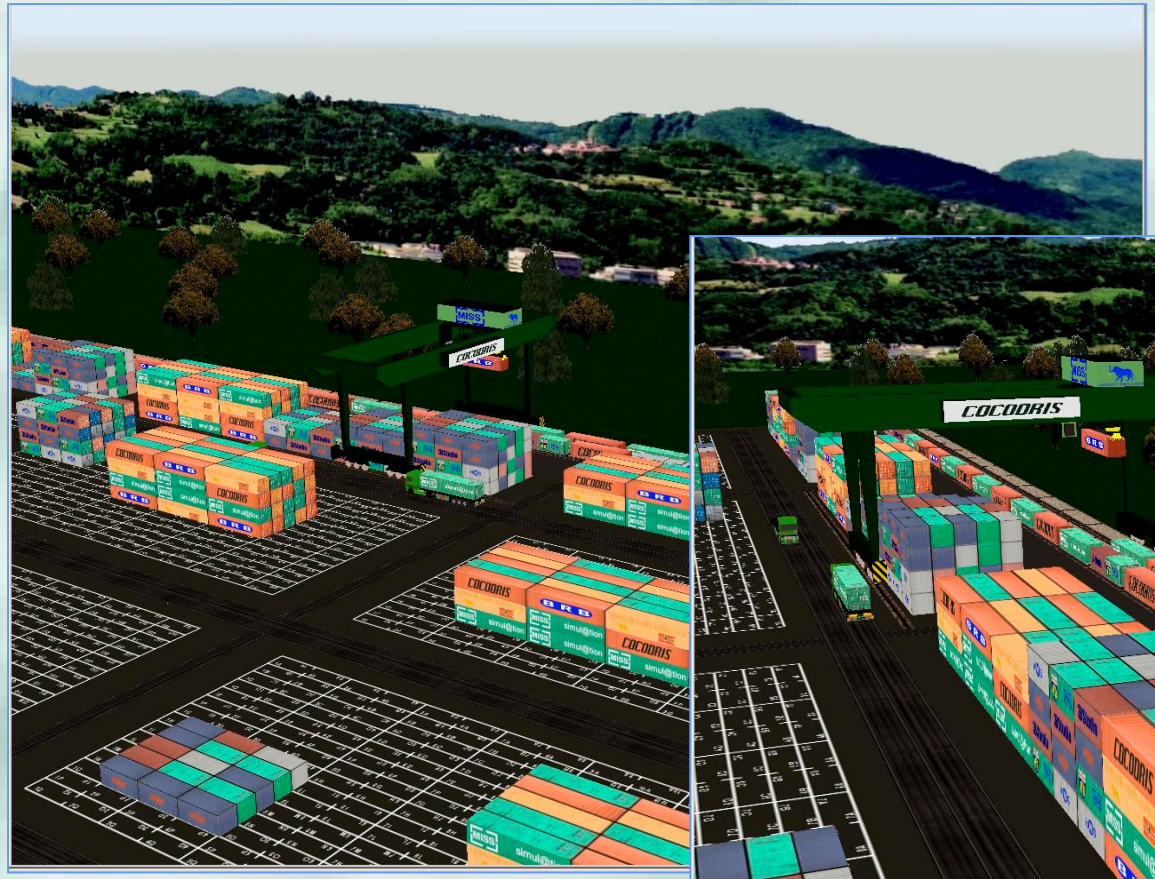
Virtual Containers in the Yard

The Cocodris Simulator was used in INNOVARE Project in order to reproduce a Container Terminal allows to reproduce the driving and interactions among trucks and cranes with different weather conditions





VIRTUAL INTERMODAL TERMINAL



Cocodris allows to develop a virtual layout in order to simulate Intermodal Terminals

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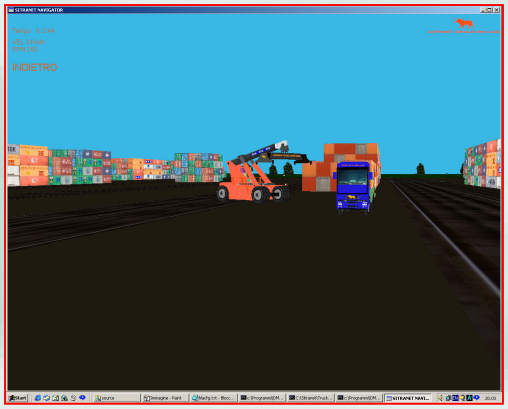
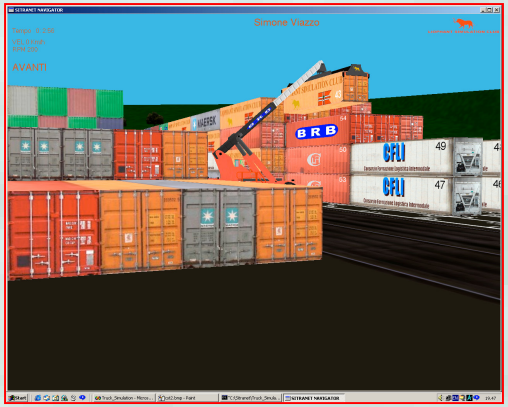
Virtual Terminal

The Innovare Terminal is designed to support training in Virtual Reality within a multimodal inland terminal

Operations in the Yard

The HLA Simulators allows to proceed in cooperative operations in the Container Terminal interacting with other vehicles.





Rail Terminal

Innovare includes a railways area1 with interactions with different kind of entities

Weather Conditions

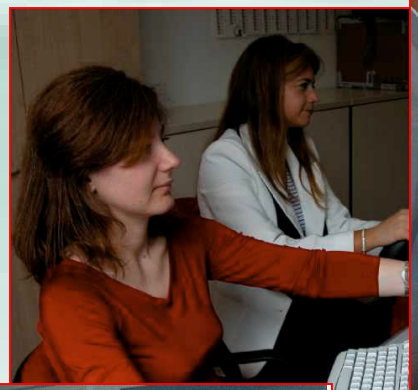
Cocodris provides very different weather conditions, including ground characteristics for testing driving ability with fog, snow, rain etc.






User Interface

Cocodris Simulator allows to setup different interfaces allowing to operate in co-operative environments



Training Modes

There are different procedure for using the simulator during training:

Single Users
j_s

Operating with a single User

3 Views
j_{3v}

Single User three Screens for Wide View

Cooperative Training
j_{conc}

MultiUser Cooperative Training

Experience in Training Procedures

Based on the multiple concurrent sessions on the Simulator (j_s 10%, j_{3v} 20% and j_{conc} 70%) and using three Cocodris simulators with 50% share between real equipment and simulators, we obtained a substantial improvement in direct student experience time

With the same class hours it was possible to increase real vehicle use by each user by more than 70%

50%

50%

Technical Web Support for Innovare

A special Web Site devoted to just technical issue presentation has been developed:

www.dipconosortium.org/cocodris/innovare

Conclusions

- Cocodris represent a very innovative development, allowing to promote simulation in an interactive distributed environment based on HLA at very low cost
- This introduces the possibility to extend use of simulation as training support in new sectors and to experience scenarios involving interaction, cooperation and competition that traditional simulators are not able to face effectively
- It is critical to extend the impact of these system over large number of users characterized by reduced resources
- The testing experience allows to validate the System by extensive training campaign

References

Development of Innovative Projects Consortium

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