# Modelli di Simulazione per l'Addestramento nelle attivita' di Logistica Fluviale


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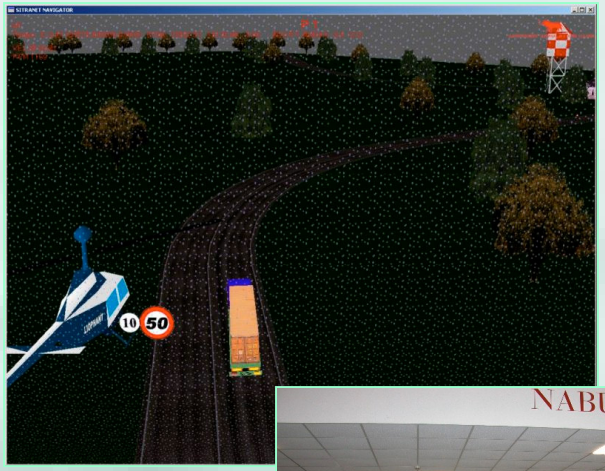
# Research Activities

- Development of Logistics Training Equipment based on Simulation
- HLA integration for Cooperative Competitive Training
- VV&A Procedures for Training Simulator within Logistics Operator




# HLA Federation per Training nella Logistica

*La ricerca mira a sperimentare diverse applicazioni per l'impiego della Simulazione Real-Time Distribuita, basata sullo Standard HLA, nel settore della Logistica con particolare attenzione a:*

- *Definizione delle Procedure Operative*
- *Formazione degli Operatori*
- *Sicurezza nell'Handling ed Efficienza Operativa*

# Driving Simulators

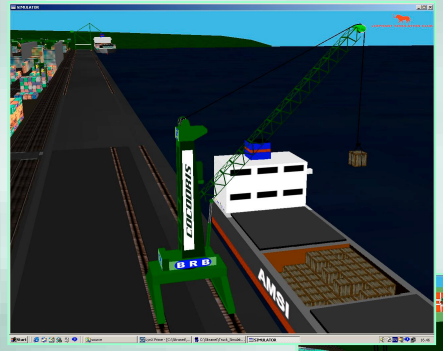
**Driving Simulators requires today the development of different equipment based on most advanced technologies (HLA, Cocodris Engine, etc). Currently simulators was devoted to reproduce:**

- **ContStackers**
- **Special Cranes**
- **Trucks**
- **Port Cranes**

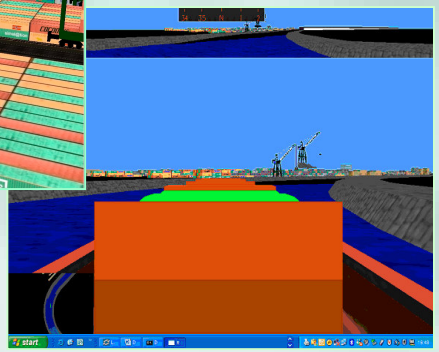


# Sea and River Port, Intermodal Terminal

**Cocodris Simulatioin Engine involves the development of all port cranes**



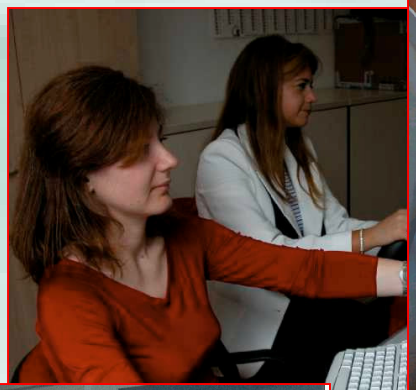
# Real-Time Distributed Simulation

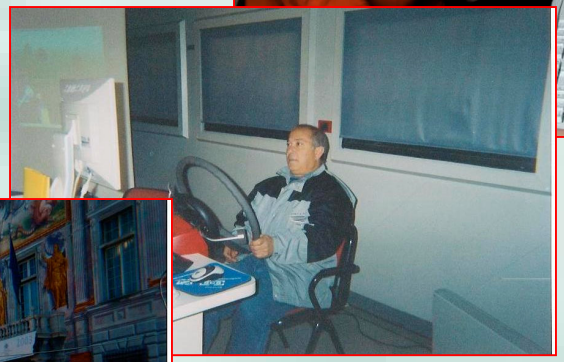
- The Intermodal terminals are an area quickly evolving, so major investments are requested in infrastructures, management systems, operative policies and training in order to guarantee competitiveness.
- Our research involve the use of Simulators based on new technologies for cooperative operations, running on low-level platforms, allowing to change training procedures and to increase safety in each terminal.



# User Interface

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

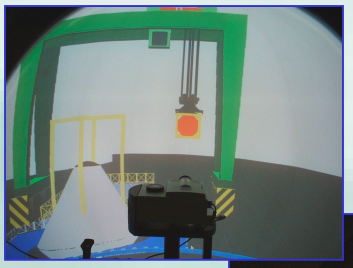


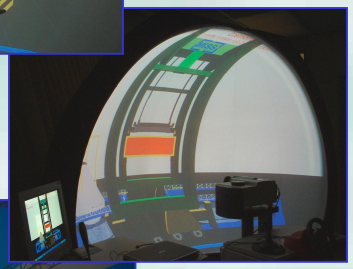


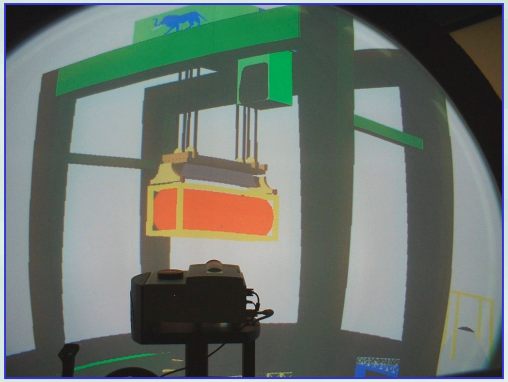
# Innovative Immersive Solutions

**This Research for Distributed Simulation of Handling and Logistics Operations at Kennedy Space Center, NASA included:**

- **Tailoring Training Procedures**
- **Refining Dynamic Simulation Model**
- **Integrating a New Special Dome**

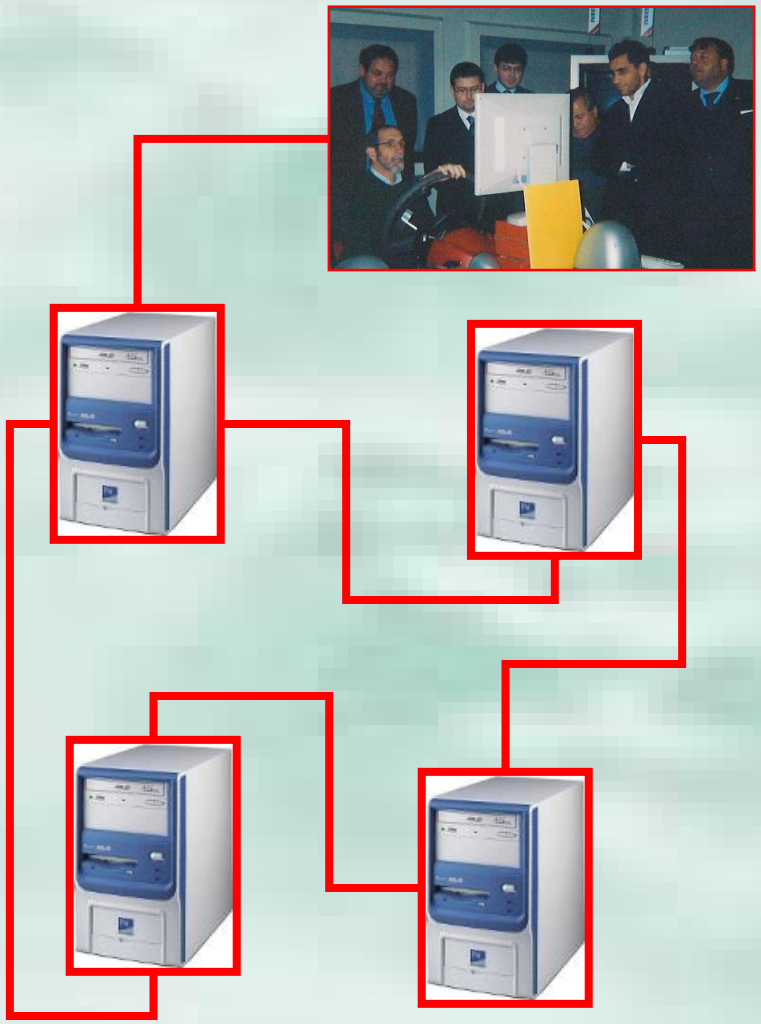




# HLA Integration

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



# HLA Cooperation

**HLA integration allows to test trailer exchange by Cocodris virtual trucks over different scenarios, as well as crane interoperations.**

*HLA High Level Architecture Standard DMSO, DoD USA*

# Weather Conditions

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



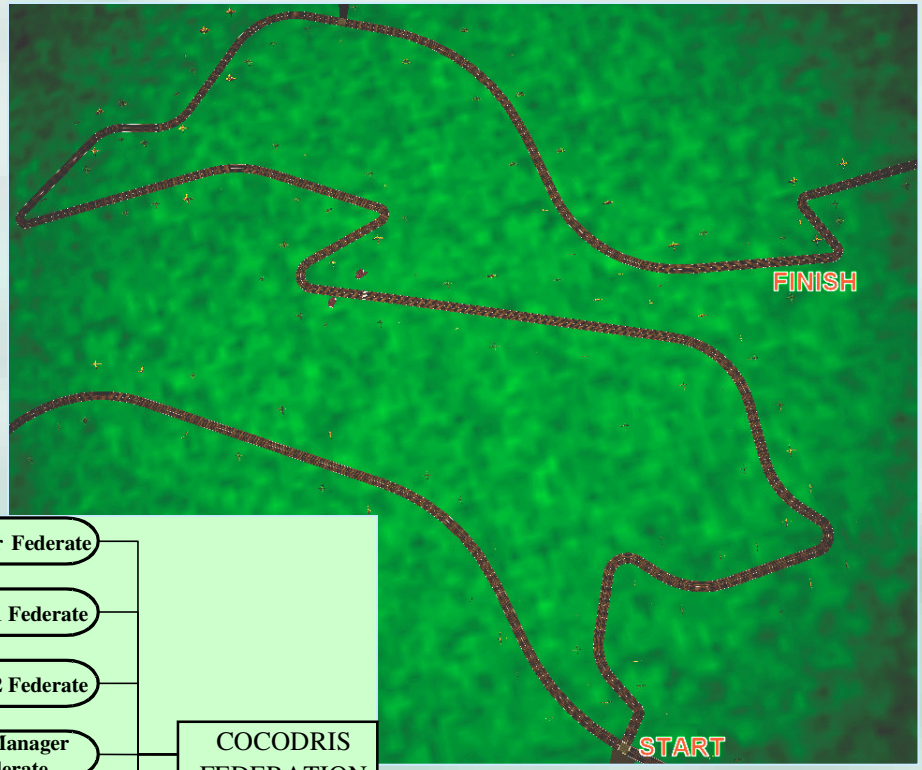


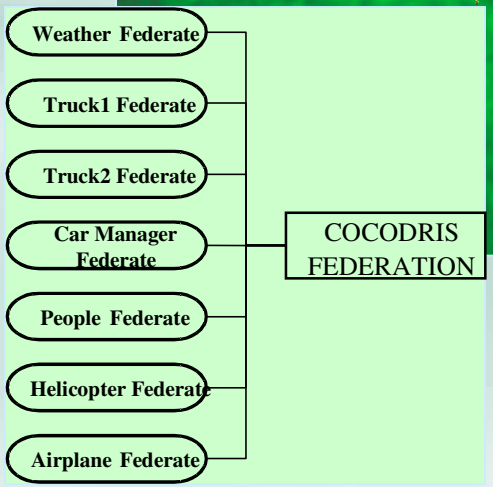


# Simulation Federation in Scenario Race

Scenario allows to define complex road mixages; while the federation for the test race included:

- People
- Cars
- Trucks
- Police Helicopters
- Observer Planes
- Weather Manager

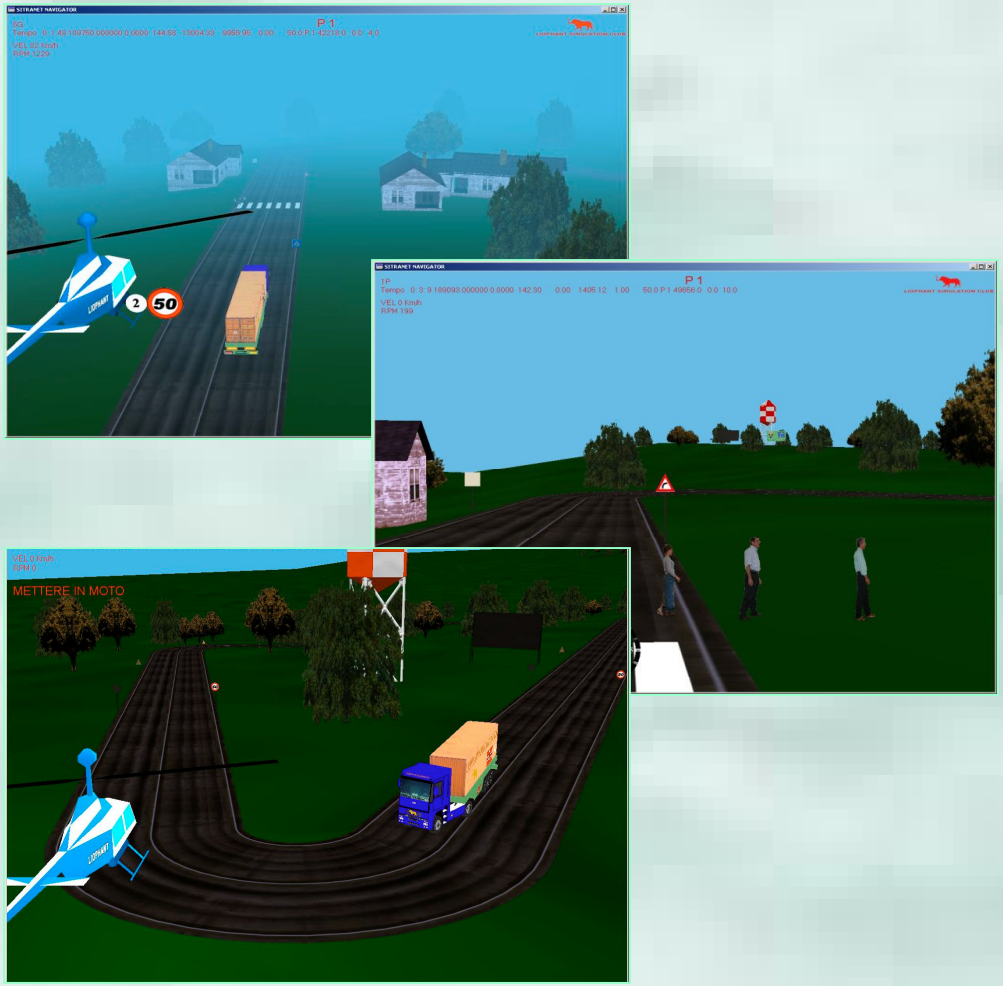


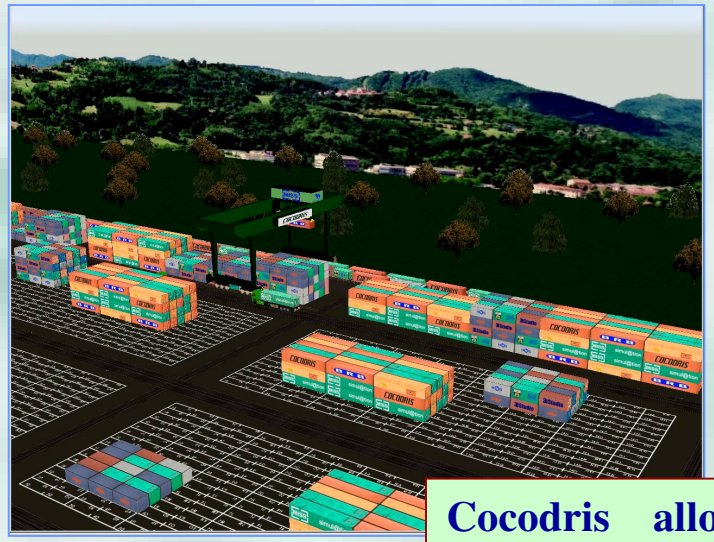
# Driving & Operative Regulation Testing

**Missions are estimated as:**

- **Best Trajectories for Truck/Trailer**
- **Collisions Details**
- **Rule Respect**
- **Reaction to Critical Events**
  - **Cars**
  - **People**

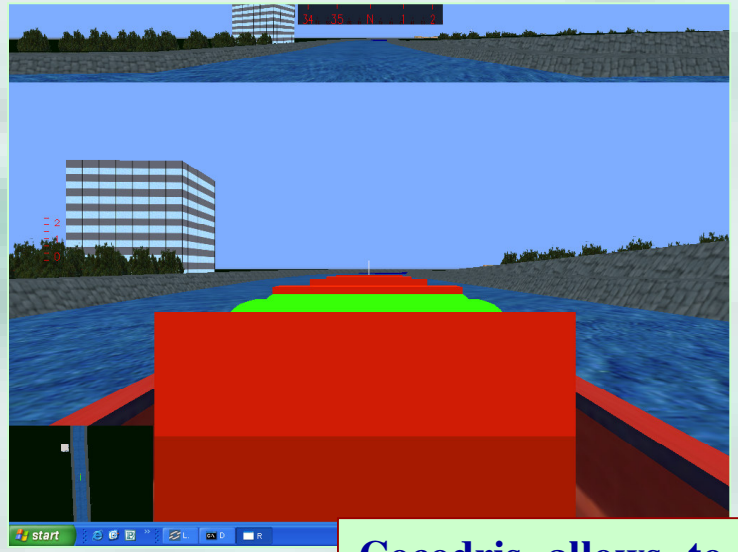


# VIRTUAL INTERMODAL TERMINAL




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


# RIVER BOATS First Testing



**Cocodris allows to develop river boat virtual environments for simulation of logistics operations**

# RIVER BOATS First Testing

**Cocodris Scenario allows to test Open Issue in each single Customization**

# RIVER BOATS: Reset Tailoring

**The Cocodris allows to reproduce operations as well as river navigation**

# 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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