Slide 1

Modelli di Simulazione per l'Addestramento in Nodi Logistici

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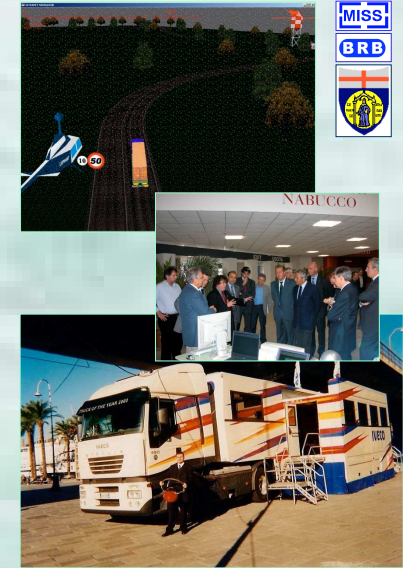
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Slide 2

Research Activities

- Italian National Truck Association promotion for Truck Driving Simulation & requirement identification
- VV&A Procedures for Training Simulator within Logistics Operator
- Extensive Experiment over Truck Driver Population

Slide 3

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**
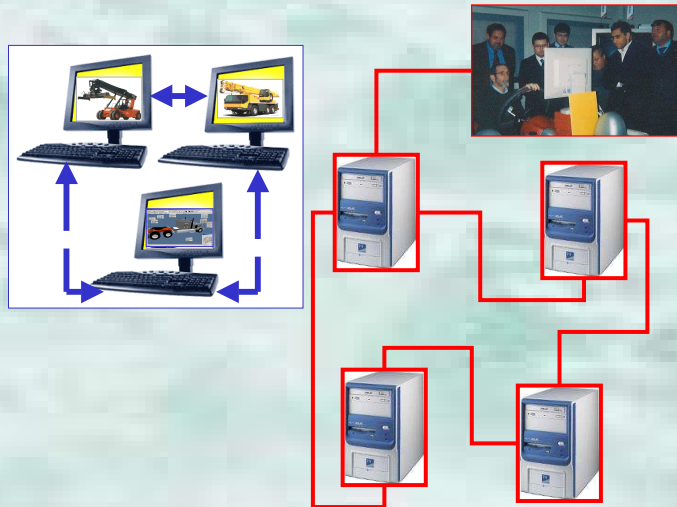– **Port Cranes**

Slide 4

Port Cranes

Cocodris involves the development of all port cranes

HLA Integration

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

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SITRANET

SImulation for TRAiniNg & Education in Transportation

SITRANET is a project sponsored by EC, devoted to creating three simulators as training equipment for crane operators based on Virtual Reality.
The Simulators includes:
      Special Crane Simulator
      Constacker Simulator
      Truck Simulator
The project was coordinated by CFLI, while simulation development and integration was under DIP leadershid with direct support from a Simulation Team

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Truck Simulator

Cocodris provides a wide set of alternative scenarios for testing driving capabilities, providing problems in term of parking, driving regulations, truck control, etc.
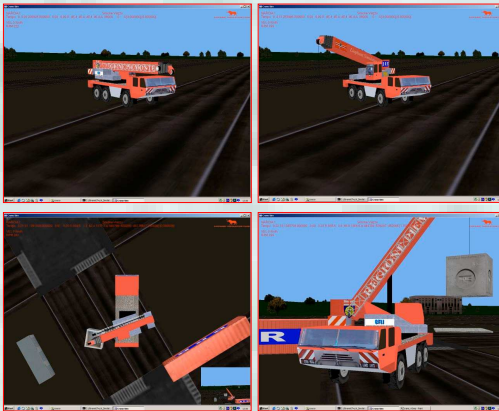
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ContStacker Simulator

The contstacker allows to simulate container handling in terminal operating under different conditions and with different containers.

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Special Crane

The Special Crane allows to simulate handling operations considering dynamic and static stability, collisions, wind effect etc.

HLA Cooperation

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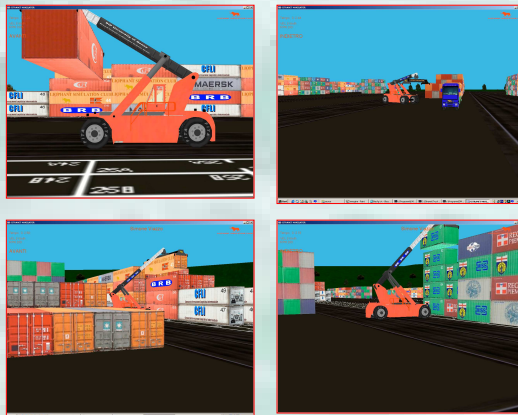

HLA High Level Architecture Standard DMSO, DoD USA

Operations in the Yard

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

Weather Conditions

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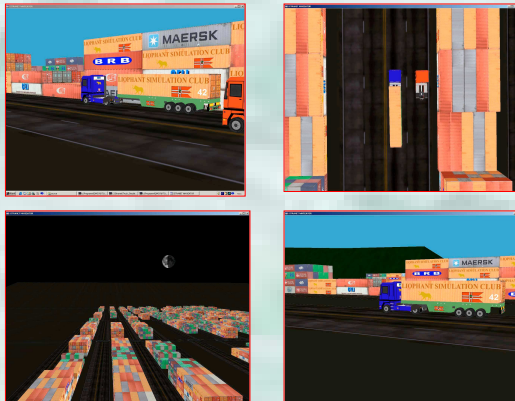
Virtual Containers in the Yard

The Cocodris Container Area allows to reproduce the interactions among trucks and cranes with different weather conditions

User Interface

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

Race & Demo FITA - CNA

SAFETY DRIVING

www.liophant.org/sitranet/sas2003

Your are kindly invited to test the Cocodris Simulator during SITRANET Project over a tournament scenario

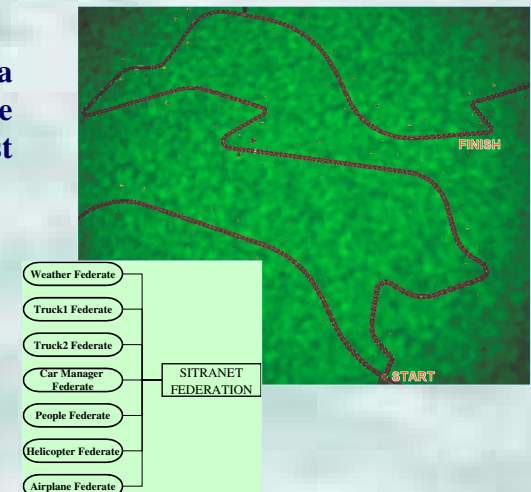# Simulation Federation in Scenario Race

Race Scenario involved a complex country road; while the federation for the test race included:

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

Weather Federate
Truck1 Federate
Truck2 Federate
Car Manager Federate
People Federate
Helicopter Federate
Airplane Federate

SITRANET FEDERATION

FINISH
START

New Driving Regulation Testing

Race Points are estimated as:

- Best Trajectories for Truck
- Best Trajectories for Trailer
- Driving Rule Respect
- Reaction to Critical Events
  - Slow Car
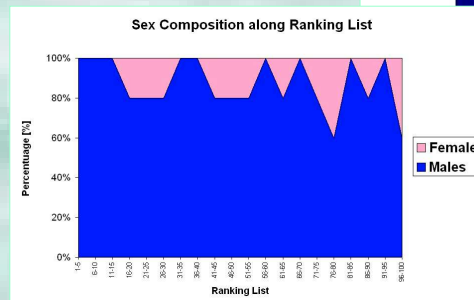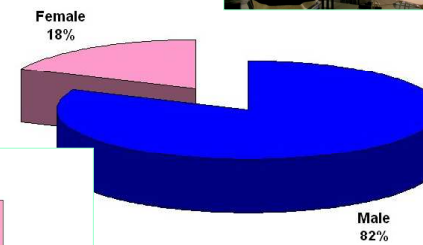 - Car at Intersection
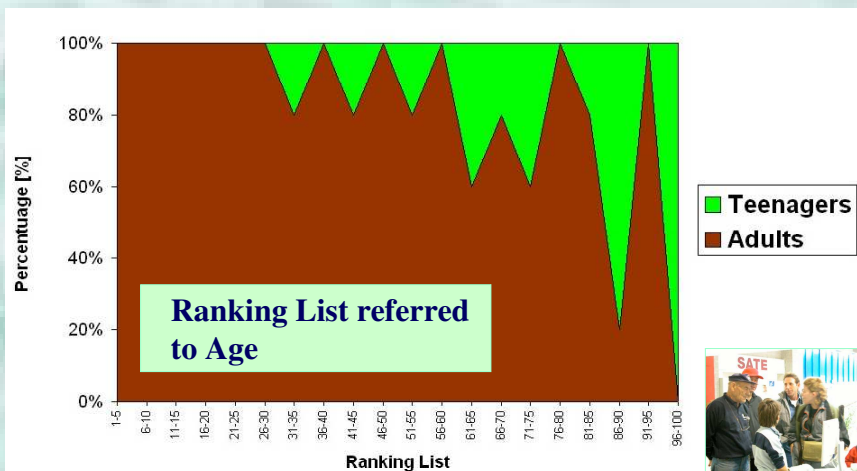 - People at Crossing

Race Test Population

The Testing was over 150 professional drivers plus additional visitors

Female 18%

Male 82%

Sex Composition along Ranking List

- Females
- Males

Sex Distribution among Truck Drivers provided good balance result for this sector

Age and Race Performances

- Teenagers
- Adults

Ranking List referred to Age

Driving Licenses over the Ranking List

Driving License Type Distribution along Ranking List

- B
- Others
- E
- D
- C
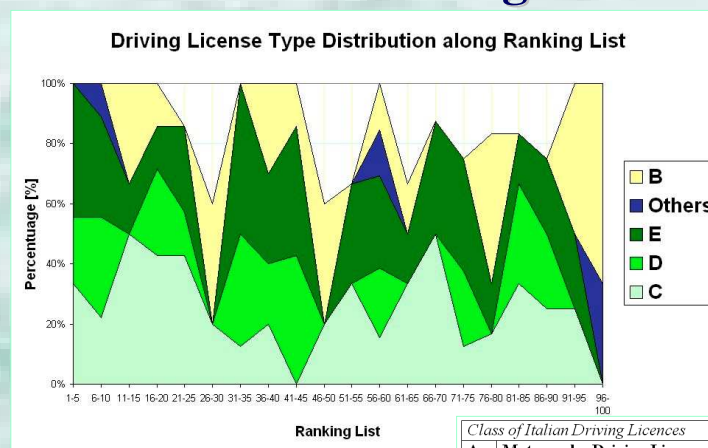
Class of Italian Driving Licences	
A	Motorcycles Driving License
B	Car Driving License
C	Truck Driving License (without Trailer)
D	Bus Driving License
E	Truck with Trailer Driving License

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 validated the System by extensive training campaign on over 150 expert users in two days
- The test provided the authors with a number of opinions and suggestions from experts: such opinions and suggestions