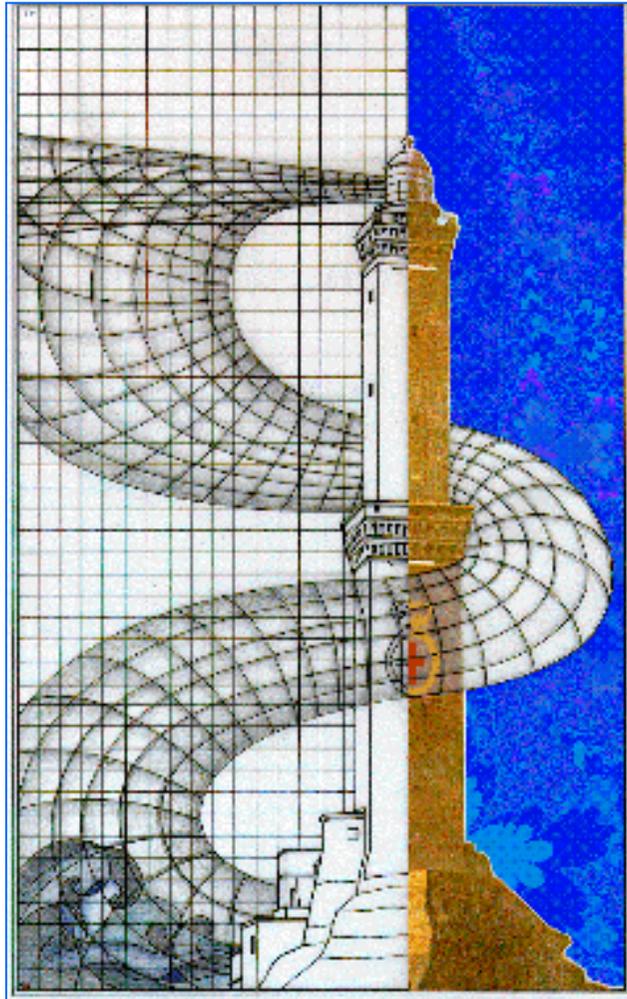


# McLeod Institute of Simulation Science Genoa Center - Report 2006



## MISS Genoa Center

*Savona Campus & Savona Labs*

*via Cadorna 2*

*17100 Savona, Italy*

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**Fax** +39 019 264 558

**URL** [www.simulationscience.org](http://www.simulationscience.org)

**EMAIL** [agostino@itim.unige.it](mailto:agostino@itim.unige.it)





# MISS - Genoa

## DIP University of Genoa

Email: [agostino@itim.unige.it](mailto:agostino@itim.unige.it)

URL: <http://st.itim.unige.it>



The research group of MISS-DIP of *Genoa University* is active from '60 in Simulation applied to Industrial Engineering.

The activities involve modeling, simulation, VV&A and analysis of Industrial Applications and Services (design, re-engineering, management, training etc.) as:

**Chemical Facilities**

**Harbor Terminals**

**Manufacturing**

**Public Transportation**

**Power Plants**

**Public Services**

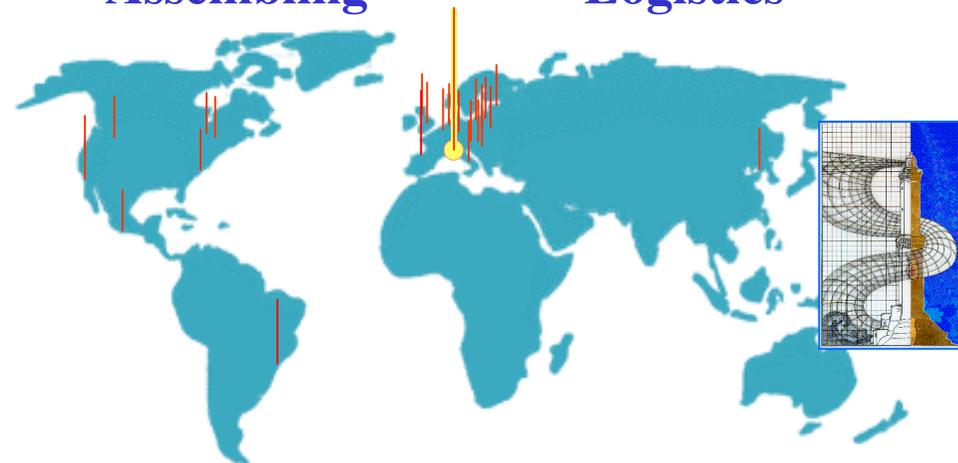
**Assembling**

**PM**

**Environment**

**Logistics**

The Department staff is in touch world-wide with the simulation community and is present actively to conferences, exhibitions and working meetings with the major Associations, Agencies and Companies.



**22 MISS Centers World-Wide  
& 5 Satellite Centers**

# DIP - University of Genoa

DIP was founded in 1997 as evolution of the Institute of Technology and Industrial Management (ITIM) that was operative from '60. DIP is composed by about 40 faculty members, 15 technicians and administrative, plus several PhD Students, external Researchers and Consultants. DIP teachers are involved in Undergraduate, Postgraduate and Professional activities in Engineering, Management. DIP active in R&D Projects for major Institutions, Companies and Governmental Organisations. DIP co-operates actively with major Excellence Centers World-Wide. Currently DIP is changing name to DIPTM.



# University of Genoa: an Overview

The University of Genoa is one of the oldest in Italy and in the World (founded in 1471 AD), it is located in middle of Italian Riviera.

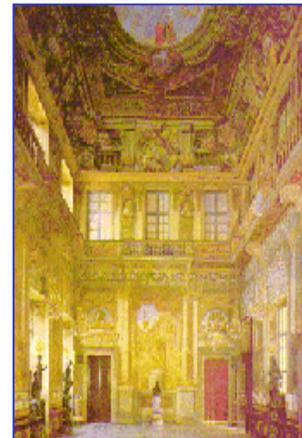
The students are about 40,000 (about 8,000 new entries), and the engineering departments has about 7,500 students (12% in Savona Branch Departments); in effect the Savona Campus Savona holds about 1,000 Engineering Students.

That campus is located about 2 km from Savona Downtown, in an old complex of barracks recently converted into new University Buildings (over an area of 200,000 m<sup>2</sup>).

For further Information about the University of Genoa:

<http://st.itim.unige.it>

<http://www.unige.it>



# Savona Campus & Facilities

The University of Genoa includes a new campus in Savona about 2 km outside Downtown; bus services and large parking areas guarantee easy access.

That structure has been obtained transforming Army barracks; today the campus includes a big park with facilities such as tennis courts and sport grounds.

The campus holds Dept. on Engineering and also Economical courses; new laboratories have been realised in Simulation, Logistics & Industrial Eng. (SAMS Project), Ecology and Chemical. Facilities for Professional Congress Centres are available in the surroundings



*Savona Campus*



*Congress Centre*



# MISS - DIP University of Genoa

The MISS-DIP of *Genoa University* carries out many industrial simulation projects in cooperation with the large corporations and small and medium sized Enterprises; some example of recent industrial simulation project are following:



**ADtranz**

ABB Daimler-Benz



**Ansaldo**



**Cetena  
Fincantieri**



**COOP**



**On-Line Simulation for Distributed  
Production Management of Locomotives**



**ADtranz**



**Distributed Synthetic Environment  
for Power Plant Design**



**Simulation & Virtual Project Management  
of Car Deck Construction for Fast Ferry**



**Simulation for Re-Engineering Supply Chain  
in a National Chain of Grocery Stores**



Members of MISS are appointed in several positions in simulation community such as:

- Italian Point of Contact of ISAG (International Simulation Advisory Group)
- Associate Vice President of SCS and Chairman of Industrial Relations for Europe
- Member of NATO Industrial Advisory Group for Simulation & VV&A for Design





# MISS - Genoa Projects in 2006



## **Production & Assembling**

APIS: Power Plant Service (Ansaldo) 2006

## **Logistics Networks & Supply Chain Management**

CYBERSAR Simulator for Portainer, (CFLI, University of Cagliari) 2006

TRAMAS: Simulation in Trasportation Management (Ministry of Transportation) 2006

WORLDIS4ME: WORD Risks, resiLience Developments & Issues in Security for Supply Chain Management

Simulation as support for Small Medium size Enterprises, (Ministry of Education) 2006

MASC New Generation: New DSS including Simulation & Forecasts (COOP Liguria) 2005

RESET: Training Simulator for River Boat (CFLI, Regione Piemonte) 2005

INNOVARE: Training Simulator for Truck and Contstacker (CFLI, Regione Piemonte) 2005

## **Business & Services**

CARNI: Meat Distribution Processes (COOP Liguria) 2006

POA NG: Automated Reordering System for Store (COOP) 2005

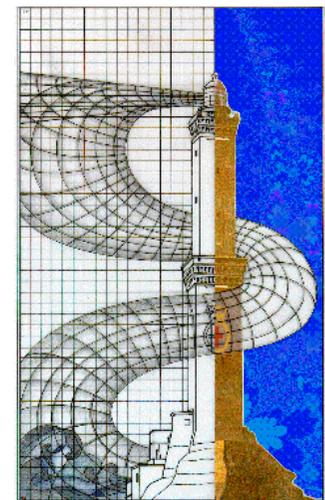
## **Service for the Society**

KATRINA STYLE: Simulation applied to Crisis Management (Ministry of Transportation) 2006

6EFFE: Parental Support for Work Scheduling (COOP Liguria) 2005

## **Military Applications**

PIOVRA: Intelligent Agent for CGF (Italian MoD, LSIS, DGA France) 2005





# **MISS - Genoa**

## **International Cooperations in 2006**



### **LESMEX**

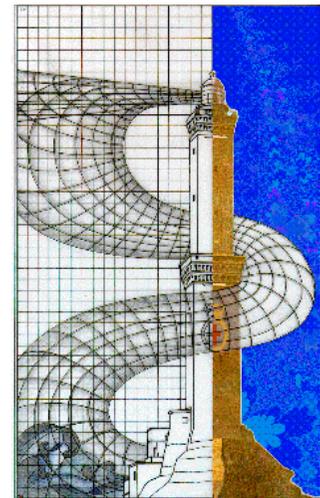
- **UNAM Mexico**

### **I\_M\_CS Common Activities**

- **Arcavacata University**
- **LSIS, Marseille, France**
- **UAB, Spain**
- **Liophant Simulation**

### **Logistics & Erasmus**

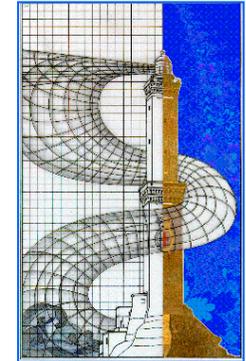
- **Riga TU, Latvia, Rutgers Univ.**
- **Sofia TU, Bogazici Univ.**





# **MISS - Genoa**

## **Scientific Activities in 2006**



**The MISS organized the following events during 2005:**

**WORKSHOP PIOVRA, Savona, Italy, in Co-operation with Liophant, 2006**  
**WORKSHOP HMS2005, Marseille ,FR, in Co-operation with LSIS Marseille**  
**WORKSHOP MAS2005, Bergeggi, Italy in Co-operation with Liophant**

**and MISS Genoa is organizing:**

**WORKSHOP PIOVRA, Rome, Italy, in Co-operation with Liophant, Feb.2007**  
**WORKSHOP HMS2006, Barcelona ,SP, in Co-operation with UAB, Oct.2006**  
**WORKSHOP MAS2006, Bergeggi, Italy in Co-operation with Liophant, Oct.2006**  
**CONFERENCE SIW2006 Europe, S.Margherita, Italy in Co-op.with SISO, Jun.2007**

**Publications 46: Journal Papers (1), Conference Papers (27), Technical Reports (7),  
Tutorial & Invited Speechs (5), Books (6)**

**ACTIVE PARTICIPATION AT CONFERENCES IN 2005/2006: 11 Conferences AMS2006  
Buzios, ECSM2006 Bonn, ESS2005 Marseille, HLA-Day2005 Lerici, HLA-Day2006 Rome,  
HMS2005 Marseille, ICAMES2006 Istanbul, MAS2005 Bergeggi, SCSC2005 Philadelphia,  
SpringSim2006 Huntsville, Wintersim2005 Orlando**



# MISS - Genoa

## Exchanges in 2005/2006

### MISS Genoa Guests

Prof. Gerson Cunha, from LAMCE/UFRJ, Rio de Janeiro, BR  
(June 2006)

Sergui Saavedra, Doctoral Candidate, Department of Engineering  
Science, University of Oxford, UK (October 2005)

Prof. Rathan Guha, from UCF, Orlando, USA (September 2005)

### MISS Genoa Visitors

Federico Tralongo Visiting LAMCE/UFRJ, Rio de Janeiro, BR,  
(June/July 2006)

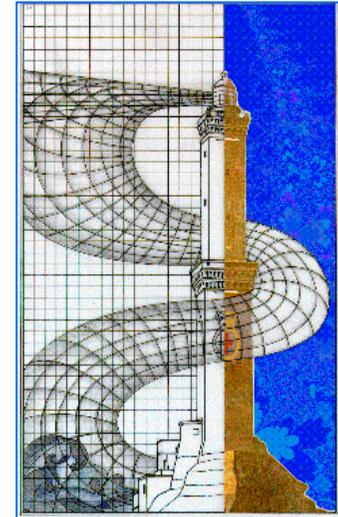
A.Bruzzone, Guest in Bogazici University Istanbul (May 2006)

Simonluca Poggi, Caterina Oderigo, Federico Tralongo, Luca  
Bucchianica Guests in ENSO Istanbul (May 2006)

Simone Viazzo Guest in NASA booth at I/ITSEC Orlando, USA  
(December 2005)

Sonia Rosa, Luca Bucchianica, Andrea Di Costanzo visiting  
Universidade Panamericana, Mexico City, MX  
(November/December 2005)

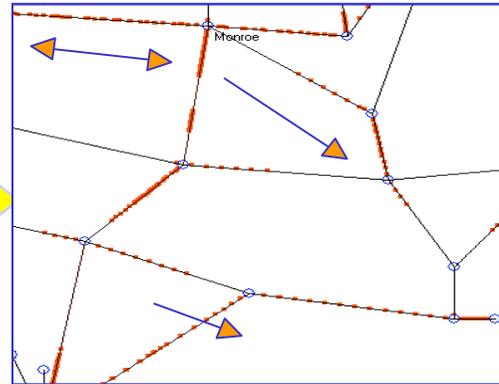
Enrico Bocca visiting KSC Orlando, USA(August 2005)



# Project: KATRINA-STYLE



State Definition

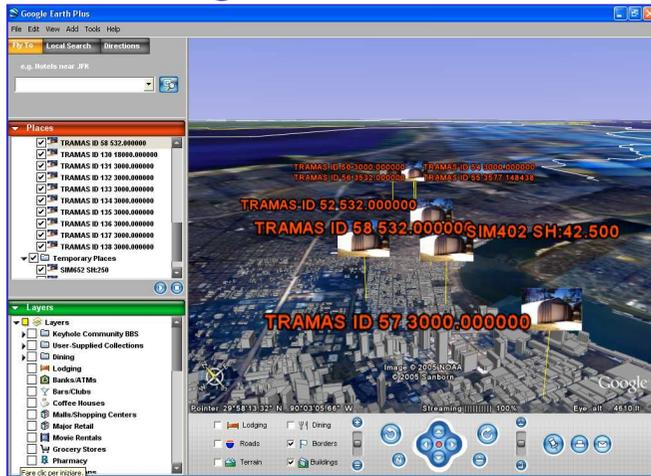


Regular Activities & Transportation

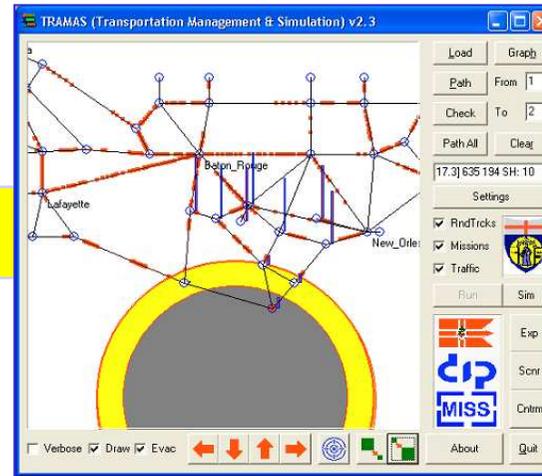


Hurricane Simulation

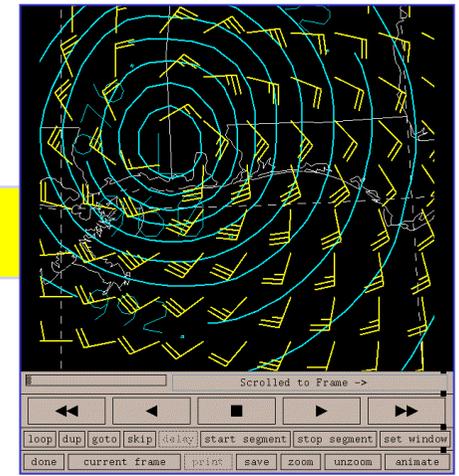
GIS Integration



Overall Simulation



Evacuation P&P



# Project: PIOVRA

*Polyfunctional Intelligent Operational Virtual Reality Agents*



PIOVRA is developed for Italian and French MoDs in the frame of the EUCLID Program CEPA11. Project aims are:

- To develop a new Generation of CGF able to simulate “Intelligent” behaviour, filling up the gap between user requirements and current available CGF performances
- To create PIOVRA intelligent CGF as effective models to be integrated in HLA Simulation for:
  - Training
  - Operation Planning
  - Operation Support
- To guarantee the possibility to Define/Configure PIOVRA CGF using Libraries and Effective Paradigms in order to guarantee Accreditation, Effectiveness and Usability of PIOVRA developments



# PIOVRA Workshop

7 February 2006

Conference Room Spes - DIPTM, DIP Savona Campus



07/02/2006	9.30-9.40	Spes Conf Room	Welcome, Roberto Mosca, DIPTM
07/02/2006	9.40-10.00	Spes Conf Room	PIOVRA Overview, Agostino G. Bruzzone, DIPTM
07/02/2006	10.00-10.30	Spes Conf Room	Lessons Learned on Current CGFs, Jean Caussanel, LSIS
07/02/2006	10.30-11.00	Spes Conf Room	Hybrid Simulation & AI: Fuzzy Logic Applied to Scenario Awareness, Francesco Longo, Liophant
07/02/2006	11.00-11.30	Campus Cafeteria	Coffee Break
07/02/2006	11.30-11.50	Spes Conf Room	Swarm Intelligence and Optimization, Luca Gambardella, ISDIA
07/02/2006	11.50-12.10	Spes Conf Room	HBR & Genetic Algorithms Characteristics Fitting, Andrea Reverberi, Liophant
07/02/2006	12.10-12.30	Spes Conf Room	HLA Simulation Scenario Challenges, Aldo Zini, Cetena/Fincantieri
07/02/2006	12.30-12.50	Spes Conference Room	Distributed Simulation Training: Advances & Open Issues, Salvatore Capasso, CFLI
07/02/2006	12.50-14.20	Spes Conf Room	Lunch
07/02/2006	14.20-14.45	Spes Conf Room	Agents in HLA Simulation for Supporting Dynamic Negotiation & Control, Roberto Revetria, DIPTM
07/02/2006	14.45-15.05	Spes Conf Room	M&S and Shore Integration of Naval Combat Systems, Marco Picollo, Selex
07/02/2006	15.05-15.25	Spes Conf Room	Verification and Validation of HLA Federation, Chiara Briano, DIP
07/02/2006	15.25-15.50	Spes Conf Room	Simulation and Artificial Intelligence for Correlating Complex Relations, Giorgio Garassino, Piaggio AI
07/02/2006	15.50-16.20	Campus Cafeteria	Coffee Break
07/02/2006	16.20-16.50	Spes Conf Room	Panel Discussion, Agostino G. Bruzzone, MISS
07/02/2006	16.50-17.00	Spes Conf Room	Closing PIOVRA Workshop Open Day, Roberto Mosca, DIPTM

The PIOVRA Workshop Open Day is an important opportunity for Simulation Community to meet together and discuss on M&S and AI. Demonstration from TESS-COM/Liophant has been presented about Human Behavior Representation.

**Attendees: 40 People including major Italian Company Representatives**

# Project: DIMS

*Dottorato in Ingegneria Matematica and Simulazione*

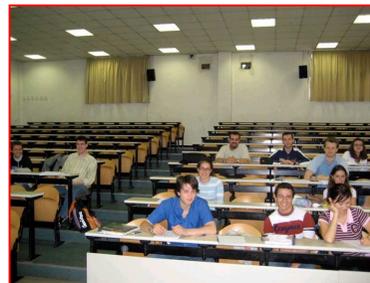


**DIMS is a PhD program in Mathematical Engineering and Simulation started in 2005 in Genoa University.**

**This PhD program was activated DIPTTEM (Production Engineering & Mathematical Modelling Dept.) and DIBE (BioEngineering Dept.) during fall 2005 and become active with beginning of 2006.**

**Today DIMS involves about 20 courses in M&S for PhD Students.**

**Currently 7 PhD Students are enrolled in this program and for 2006 another 6/8 positions are expected to be activated**



# Project: TRAMAS4.0A

*Transportation Management & Simulation*

TRAMAS4.0A represent a program for Italian Ministry of Transportation based on a special customization of TRAMAS.

This program is devoted to support development of new Professional Courses

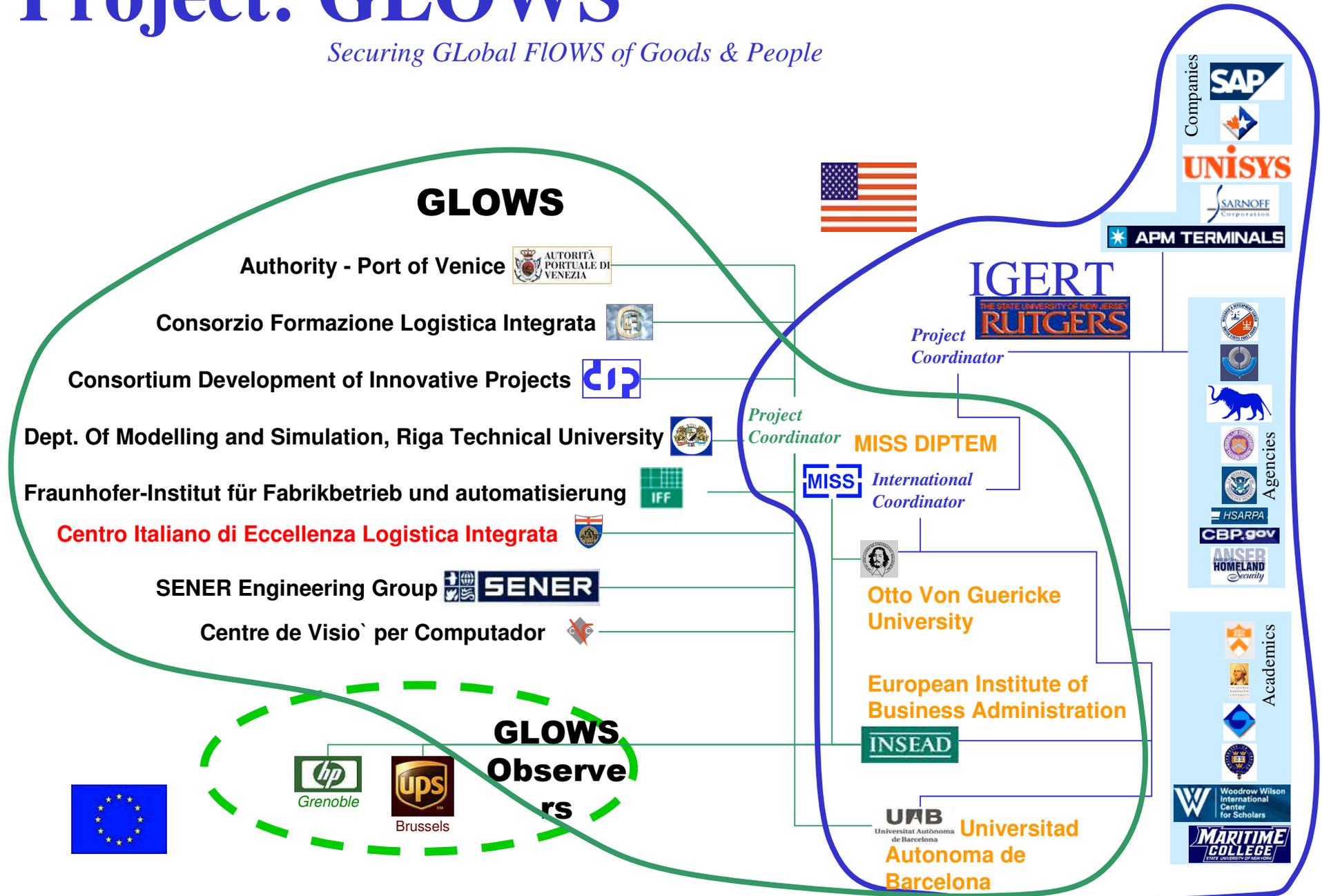
Managers of Road Transportation Companies based Business Games based on Simulation.

At the same time TRAMAS4.0A is looking forward for supporting the National Department on defining and tuning new policies and constraints for this sector.



# Project: GLOWS

Securing GLObal FLOWS of Goods & People



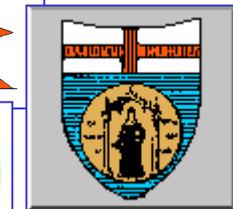
# Project: SIREN

## Professional Courses

The professional courses have been organized since 2000 for WorldWide professionals, in Italian, French and English, focusing on the following subjects:

- PM: Project Management in M&S Projects
- M&S: Modeling & Simulation
- HLA: High Level Architecture
- VV&A: Verification, Validation and Accreditation

The courses include lecturing and exercises; teachers are world-wide experts from major excellence centers (i.e. Boston College, Genoa University, NASA, DMSO, National Center for Simulation, SAIC, Aegis Technologies, California State University, Riga TU, UCF, McLeod Institute of Simulation Science).



# Simulation Technology Transfer

Since 2000 MISS-DIP organises Simulation Professional Courses:

- Project Management
- Modelling & Simulation
- High Level Architecture
- Verification, Validation & Accreditation

The Lecturers included experts from major excellence centres (i.e. Boston College, University of Genoa, NASA, DMSO, National Center for Simulation, SAIC, Aegis , California State University., Riga TU, UCF , McLeod Institute of Simulation Science).

The course attendance (PM ~60, M&S 15, HLA 20, VV&A 10) included Companies (i.e. Piaggio Aero Industries, Alenia Aeronautica, Alenia Marconi, SIA, Fincantieri, COOP) and Academia (Pol.Torino, TU Delft, Univ.Marseille, Pol.Milano, Univ.Firenze, Univ.Bari, Univ.L'Aquila, etc.).



*Course Location*



*Lecturing*



*Team Working & Exercises*



# Conclusions

The MISS DIP is acting, with major partners, as a reference point between users and providers in simulation area.

The integration of experts, technicians is providing very good results on real case studies and complex projects.

A new active area of development is related to distributed simulation and web-based modeling for extending the impact and exploitation of these proposed systems.

Every year MISS promotes Conferences and International Workshops focusing on application of Modelling & Simulation; for instance, this year: Summer Simulation in Calgary I3M/HMS in Barcelona, MAS in the Italian Riviera and AMS in Brazil.

There is a constant interest in fostering joint cooperation and exchanges with international Excellence Centers working on simulation.

