

# Modelling & Simulation Projects



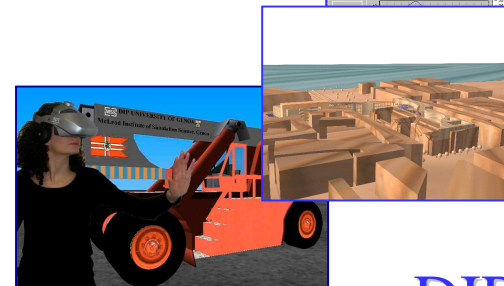
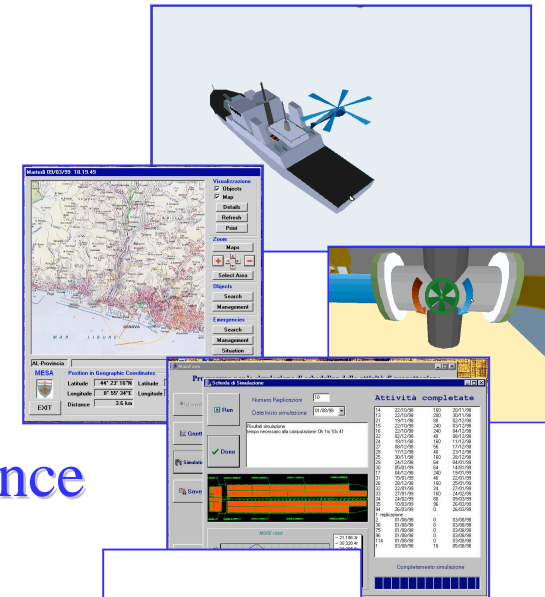
Liophant Simulation Club



McLeod Institute of Simulation Science  
Genoa Center

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{agostino, roberto}@itim.unige.it  
<http://st.itim.unige.it>

ITALY

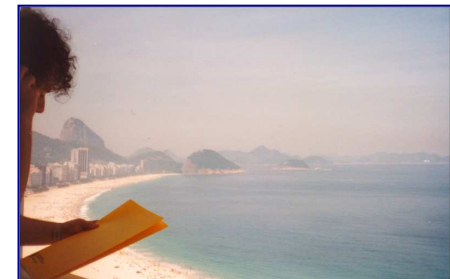


DIP  
University of Genoa



# 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.



# 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.

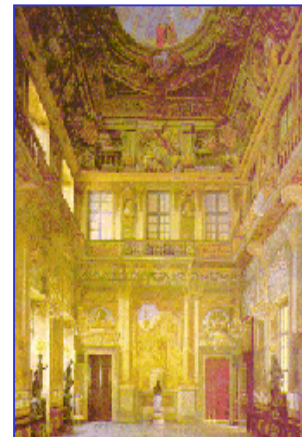
The students are about 40,000 (about 8,000 new entries), and the engineering departments has about 7,500 students (12% in Savona Branch Departments); in effect the Savona Campus Savona holds about 1,000 Engineering Students.

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*





# Liophant Simulation Club

Email [info@liophant.org](mailto:info@liophant.org)

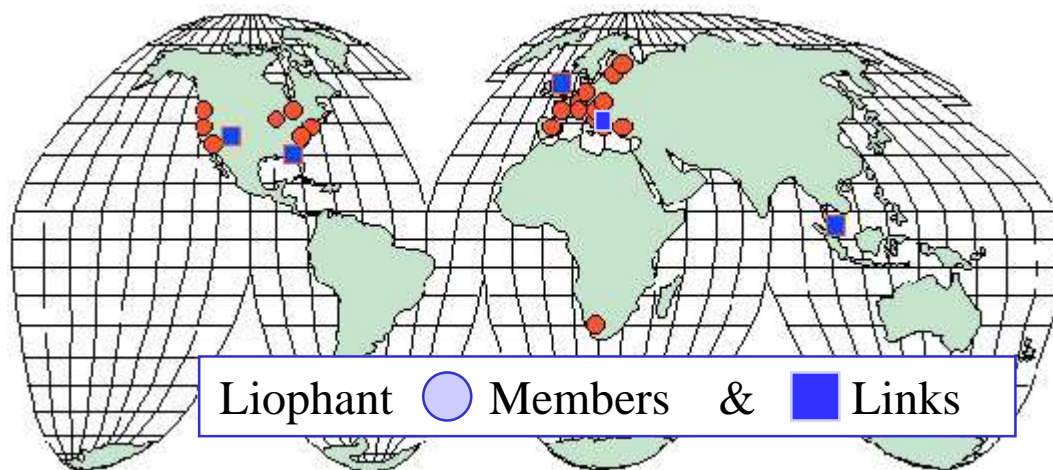
The *Liophant Simulation Club* involves World-Wide over 120 Scientists and Technicians working in Companies and Academia.

The *Liophant* develops Advanced Projects for Real Industrial Applications as:

- ∇ VAED : Virtual Aided Engineering & Design (Gas Turbine Modeling)
- ∇ Safety First : Virtual Ship Handling Simulation in Harbor Environment
- ∇ Wolves: Warehouse Management & Logistics Simulation
- ∇ Health Care Survey

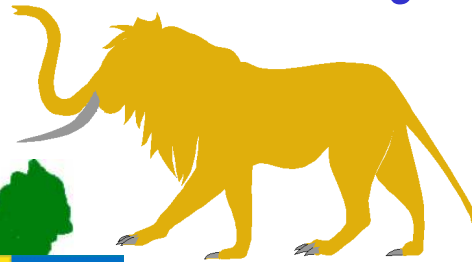
The *Liophant Simulation Club* promotes international Cooperations and exchanges with Excellence Centers World-Wide (i.e. NCS)

<http://www.liophant.org>



# The International Activity of Liophant

ICAMES2002, Istanbul, May    
 CHARME & ROSES  
 S.Viazzo, O. Serindat, F.Bertone  
 Best Projects Award

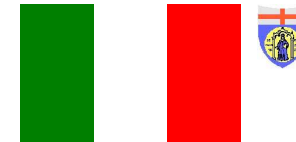



Student Activity **2002**  
 PhD, Master, BS

Workshop HMS2002/MAS2002  
 Bergeggi, Oct.



Sweden  
 December  
 S. Pozzi Cotto 



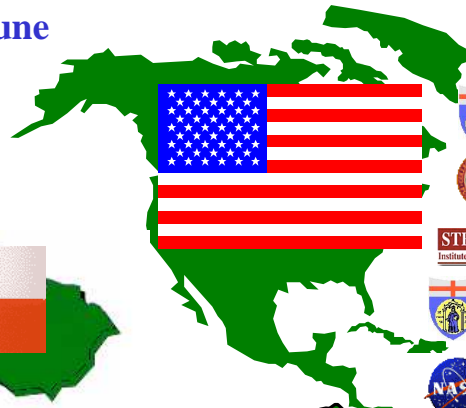
IEPAL Genoa/Venice  
 E. Briano, E.M. Mantero,  
 S. Viazzo 

Consorzio Formazione Logistica Intermodale



CATE2002  
 Crete, June  
 A. Testa

AISS2000  
 Lisboa, June  
 A. Testa



Boston College &  
 Stevens Institute  
 Boston, January  
 M. Bonifacino     
 Orlando July-Sept.-Dec.  
 NCS & Nasa - IEPAL  
 E. Costa, E.M. Mantero



MIC00/AI00, Innsbruck, Feb  
 Automation & Simulation  
 E. Briano, S. Viazzo, O. Serindat



BATCOS  
 W.Bohemia Univ.  
 December  
 S. Pozzicotto



WRV2002 UFRJ  
 Rio De Janeiro  
 December  
 S. Viazzi 



ITEC2002  
 Lille April  
 O. Serindat  
 S. Viazzo 



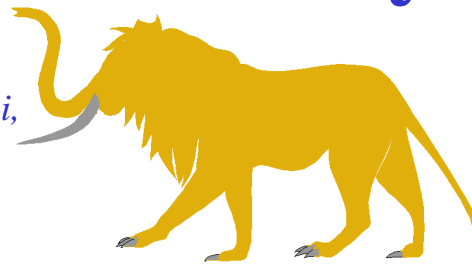
ESM2002  
 Darmstad  
 S. Viazzi

FAIM2002 &  
 ESS2002  
 Dresden  
 A. Testa  
 S. Pozzi Cotto

# The International Activity of Liophant

ICAMES2003, Istanbul, May  
DIROMATIC, NERONE

F.Figini, M.Sanguinetti, G.Boero, C.Caballini,  
V.Barucci, S.De Michelis  
3rd Best Projects Award



Student Activity **2003**  
PhD, Master, BS

Workshop MAS2003  
Bergeggi, Oct.

**IEPAL/IEEE**  
Genoa/Novara  
E.Mantero, D.Carini  
Over 26 students from USA,  
Germany, France, Turkey & Italy

Workshop VMASC,  
Liophant MISS  
Genoa, September  
F.Figini, D.Carini

SCSC2003  
Student Workshop  
Montreal July

Over 10 students from USA, Canada

Boston College &  
Stevens Institute

March-April  
V.Bortoletto, G.Boero,

M.Sanguinetti, C.Caballini  
Over 10 students from Germany, France & Italy

Orlando March-April  
NCS & UCF - IEPAL

V.Bortoletto, G.Boero,  
M.Sanguinetti, C.Caballini  
Over 10 students from Germany, France & Italy

DS-RT2003, ESS2003  
Delft, October

P.Blomjous,,  
van Houten



MIC03, Innsbruck, Feb  
Agent Driven Simulation  
E. Briano

Liophant Simulation Club

SportFest 2003, June  
Liophant Football  
Team 3rd Position

SCS, ICT & Univ  
Southern California  
November  
Danila Carini

Universidad  
Panamericana  
Danila Carini December  
Mexico City

UFRJ  
Rio De Janeiro  
October-November  
F.Figini

MISS - DIP University of





# MISS - 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

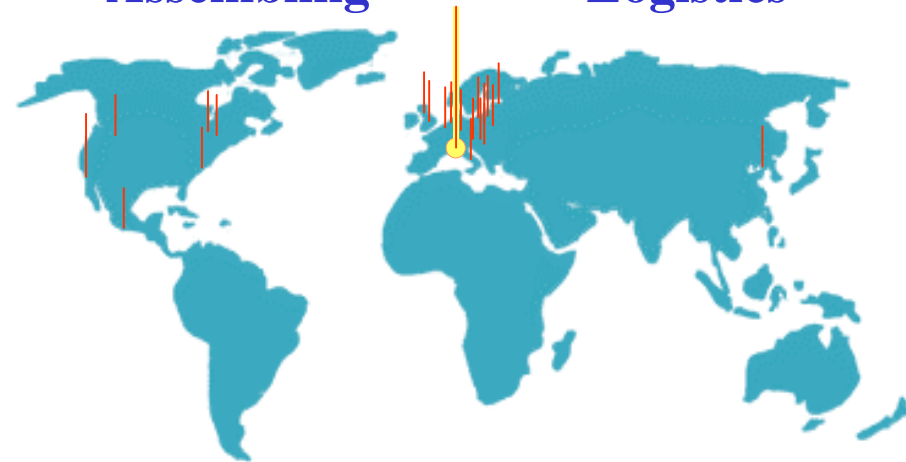
Assembling

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.



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



MISS - DIP University of Genoa



Liophant Simulation Club



# 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:

	<b>ADtranz</b>	<b>On-Line Simulation for Distributed Production Management of Locomotives</b>	<b>ADtranz</b>
	ABB Daimler-Benz		
	<b>Ansaldo</b>	<b>Distributed Synthetic Environment for Power Plant Design</b>	
	<b>Cetena Fincantieri</b>	<b>Simulation &amp; Virtual Project Management of Car Deck Construction for Fast Ferry</b>	
	<b>COOP</b>	<b>Simulation for Re-Engineering Supply Chain in a National Chain of Grocery Stores</b>	
			
			
			
			
			

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

# 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



# Project: POWERS



*(Psychological Operations and Weapons: Evaluation by Robust Simulation)*

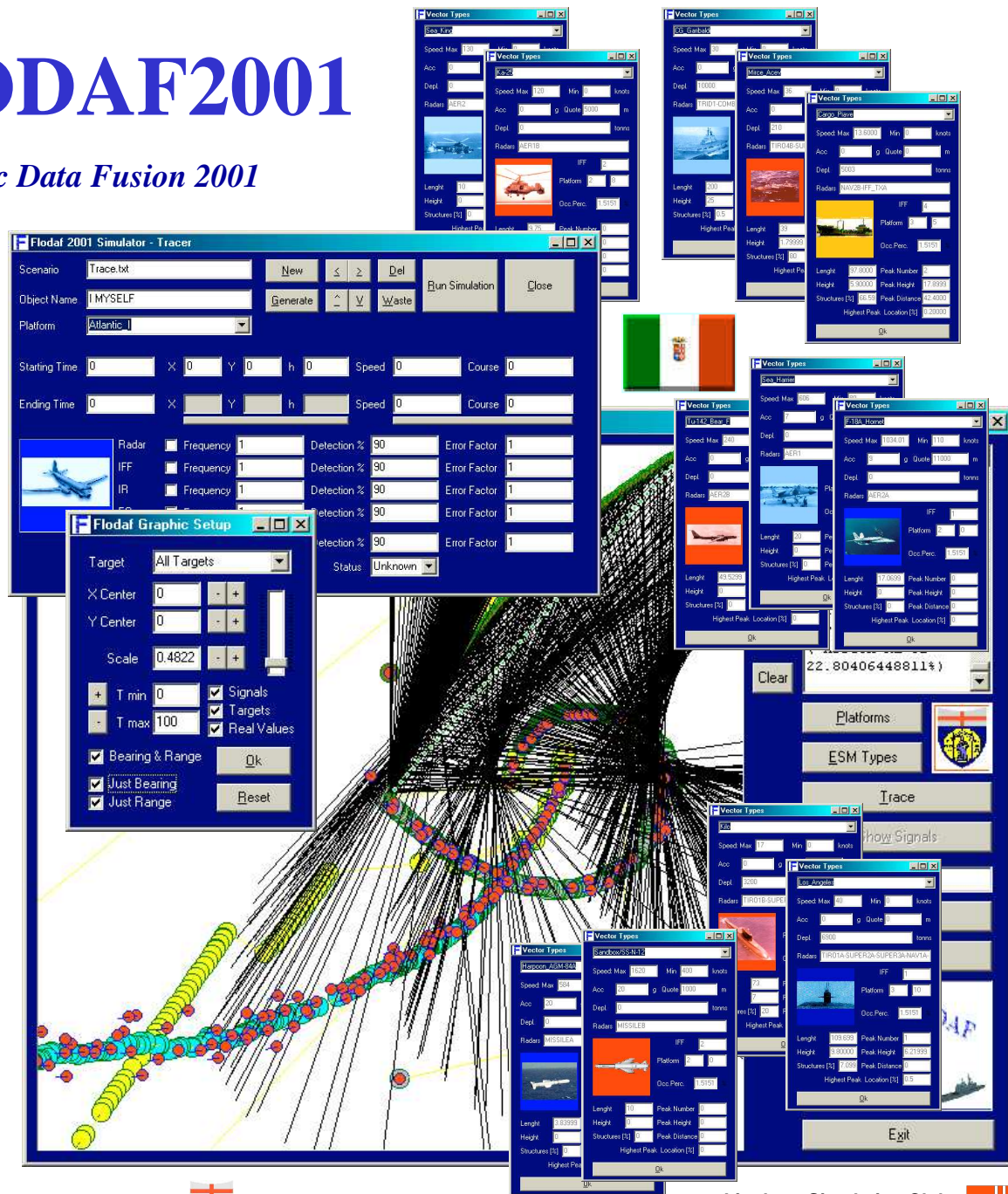
**POWERS is a Project joining Italy, France and Turkey under an EUCLID CEPA11 Program**

- **The POWERS project aim is to develop an innovative Simulator of PSYOPS (Psychological Operations) able to evaluate their effectiveness and consequences. POWERS is based on HLA (High Level Architecture) as framework for the model in order to guarantee the usability in HLA Federations and wargames.**
- **POWERS includes a stochastic simulator that reproduces PSYOPS by using AI (Artificial Intelligence) and integrating different models allowing to estimate the range of alternatives, so it becomes a DSS (Decision Support System) for evaluating the risks connected with PSYOPS in complex scenarios.**
- **POWERS creates a library of dynamics models for estimating the impact of the PSYOPS in different frameworks while POWERS Simulator provides estimation of the different possible scenario evolutions considering the stochastic factors.**
- **POWERS applies an advanced integration of methodologies based on AI in order to support the PSYOPS knowledge management; Fuzzy Logic is extensively applied for providing both understandable models and correct behaviour representation. The complex nature of the results provided by PSYOPS requires special analysis: for this reason POWERS uses Artificial Neural Networks as support for identification and correlation between causes and effects.**

# Project: FLODAF2001

*Fuzzy Logic Data Fusion 2001*

FLODAF 2001 is an evolution of FLODAF project; this suite includes a Scenario Generator and a Simulator for analyzing the Data Fusion performances over complex Air-Naval scenarios including ships, submarines, missiles, airplanes and helicopters.



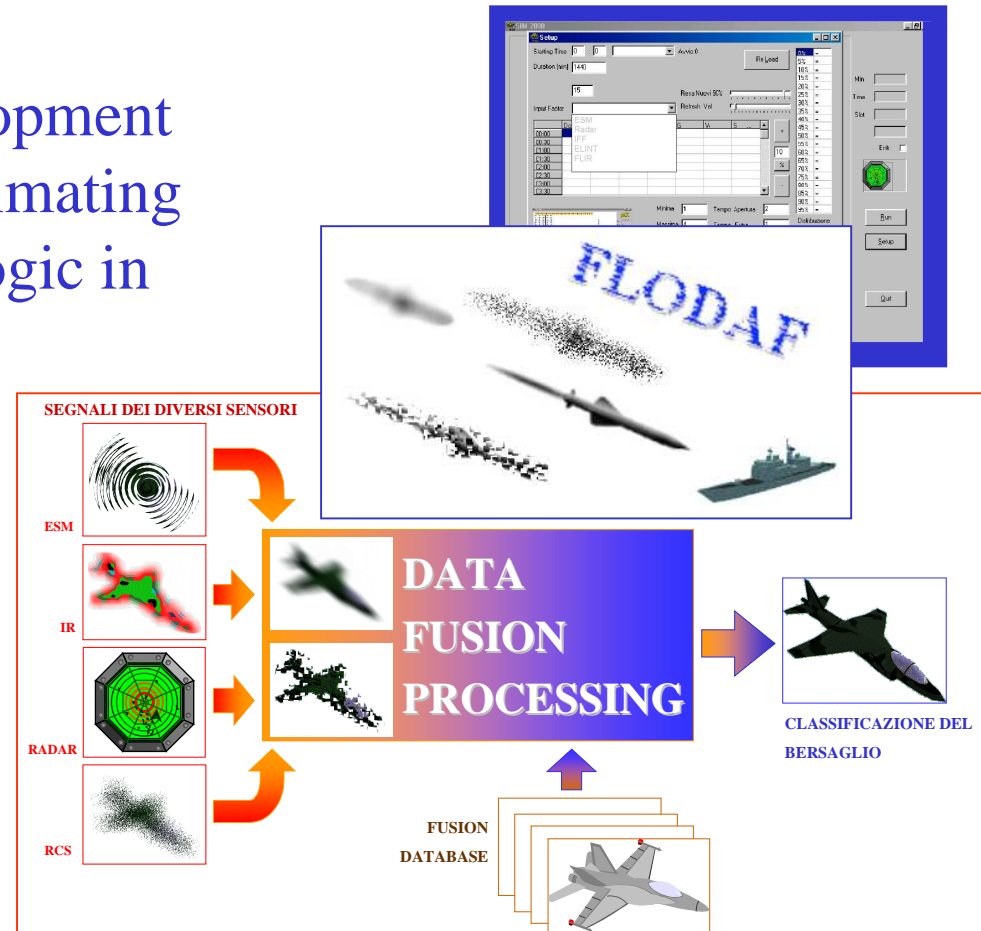
# Project: FLODAF

*Fuzzy Logic Data Fusion*



FLODAF involves the development of a Virtual Prototype for estimating the effectiveness of Fuzzy Logic in Data Fusion.

FLODAF focuses on Naval Sensors Applications involving Data Fusion of ESM, Radar, IFF and IR/EO for both surface and air detection, classification and identification.



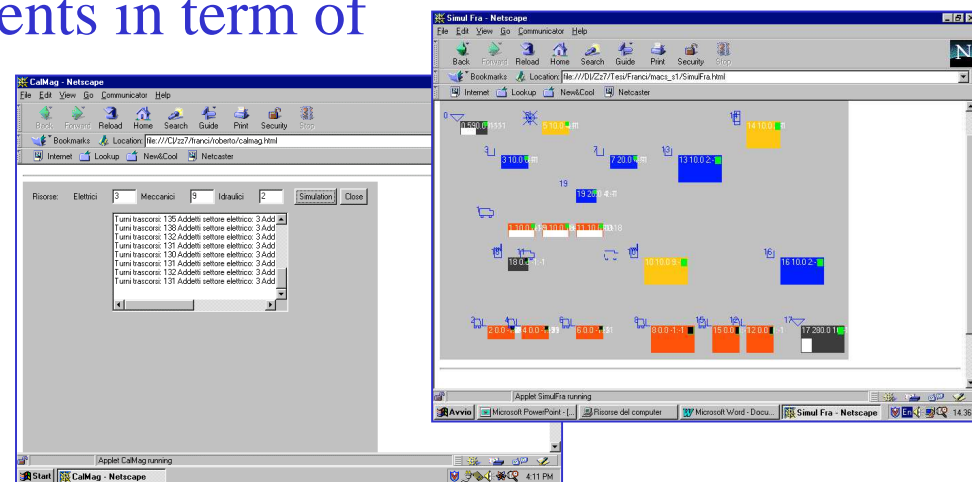
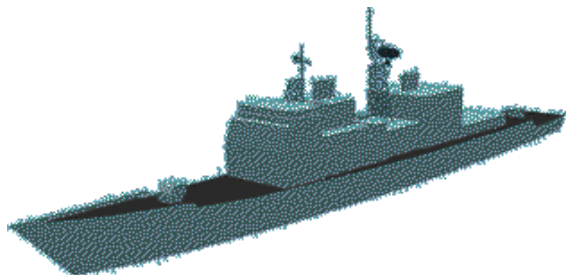
# Project: WSS&S

*Weapon System Service & Simulation*

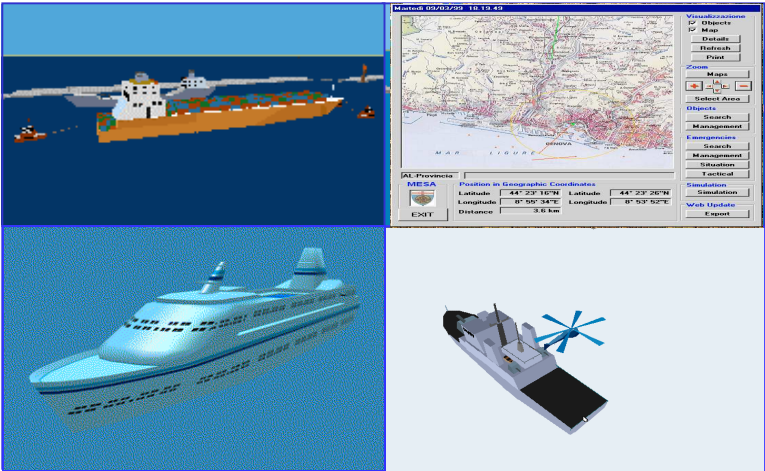
This Simulator is devoted to re-engineer Weapon System Logistics and Service.

The Simulator is operating in Taranto Base to support the service planning of Torpedo, Missile, Rocket Launchers and Naval Gun Systems.

The simulator is a web-based stochastic simulator and supports the concurrent service management; the model is object-oriented and the implementation allows to operate directly with regular browsers without any special requirements in term of platform or plug-ins..



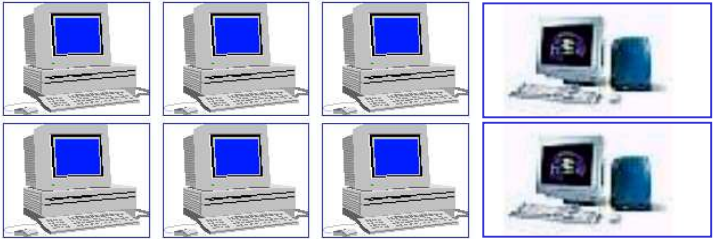
# Distributed Virtual Maritime Environment



*DIS*  
*HLA*

**Procedure Design, Risk  
Analysis, Re-Engineering  
and Distributed Training**

*C/C++*  
*Java*



**Distributed, Cooperative  
Planning and Management**

**Distributed Operation Control**

**A Platform Independent Distributed Environment for  
Maritime Applications**

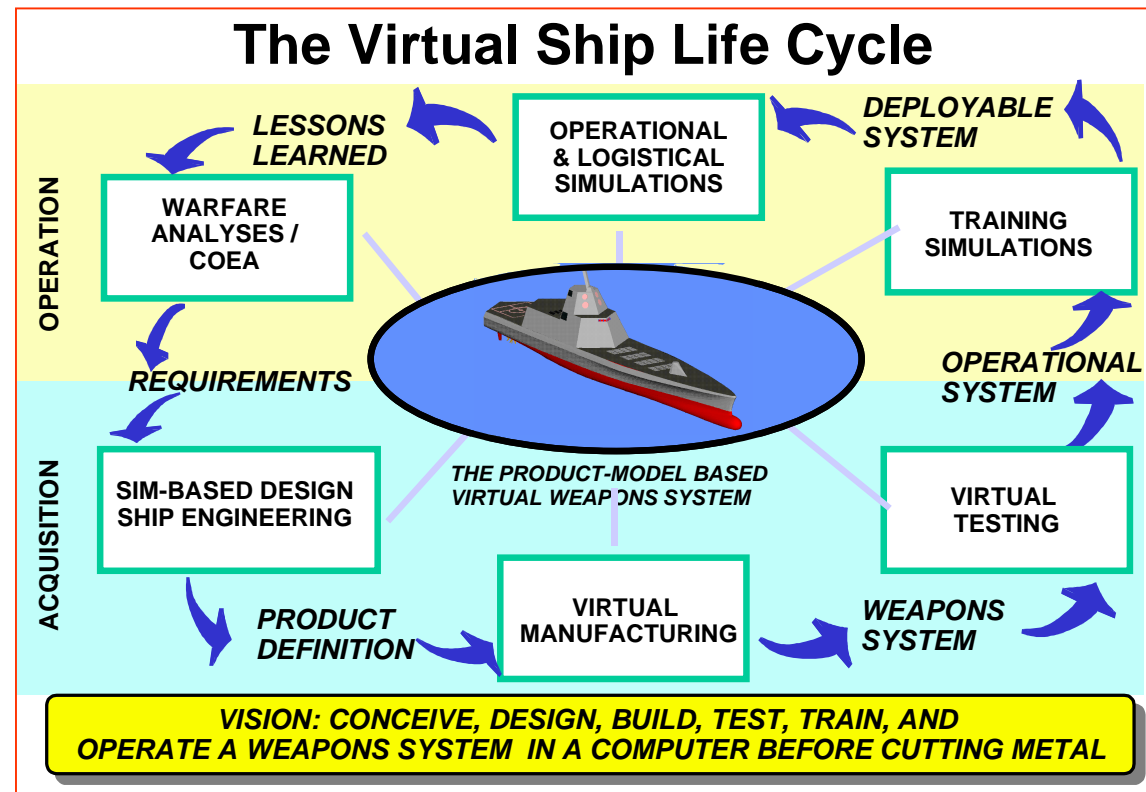
# Project: NIAG SG-60

*Simulation Based Design And Virtual Prototyping (SBD & VP)*



The NIAG SG-60 is devoted to evaluating the effectiveness of SBDVP on Ship Design

The results of the SG60 Study include analysis of Virtual Prototype VV&A procedures, Simulation Based Acquisition impact in terms of saving, costs, resources

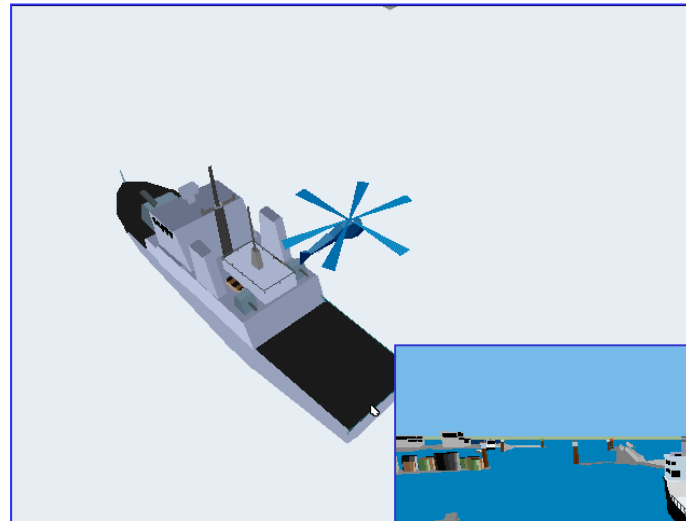


# Project: SAFETY FIRST

*Training & Design for Ship Handling*

The simulator includes a complete virtual reproduction of Genoa Harbor and it's devoted to the design and training of Harbor Technical Services Operators (Pilots, Tugs & Boat Men)

This simulation system is designed in order to be portable for cooperative training on web server just using regular browser with specific plug-in.



*Developed  
in 1996*



- *Full Interactive Real-Time for Training*
- *Faster than Reality for Procedure Design*
- *Virtual Environment of Genoa Port on a PC*

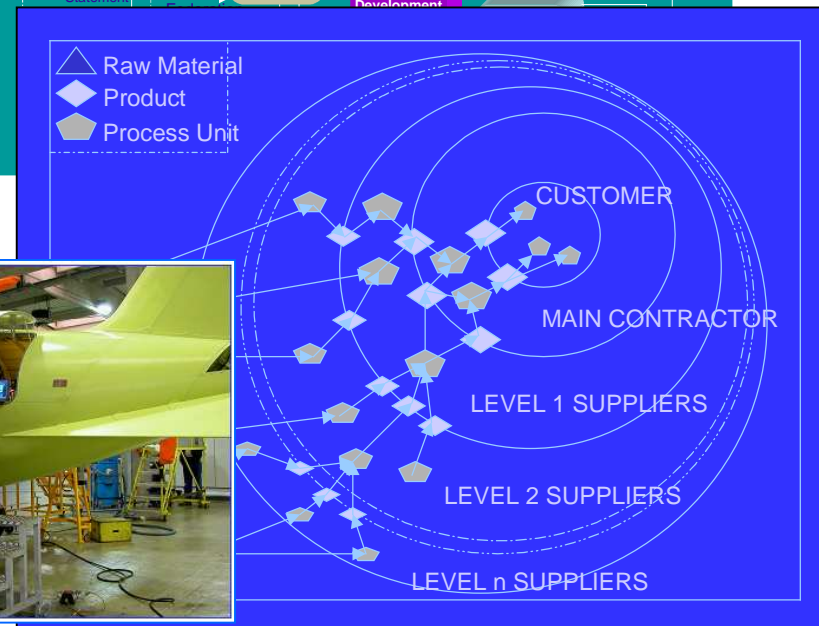
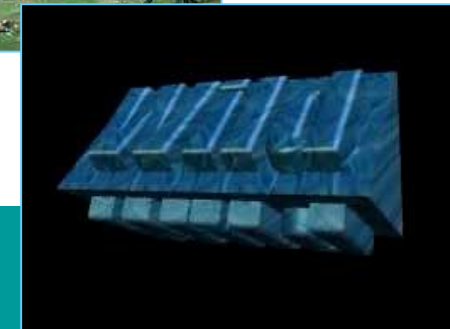
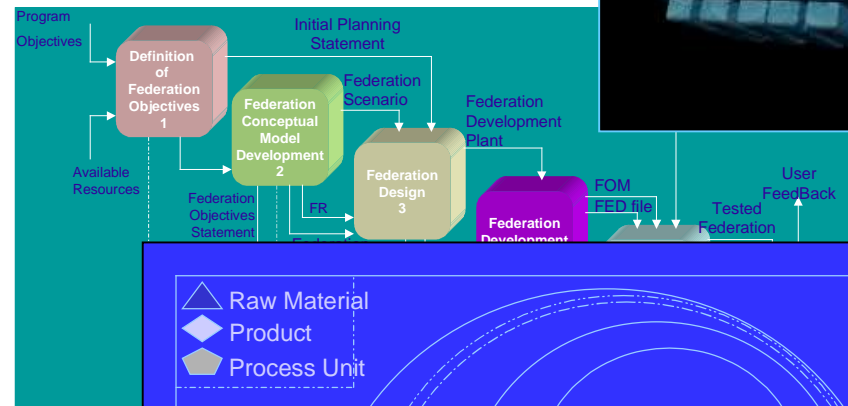
# Project: WILD

*Web Integrated Logistics Designer*



The WILD project involves the development of a Federation composed by Simulators, Scheduling Systems and ERP.

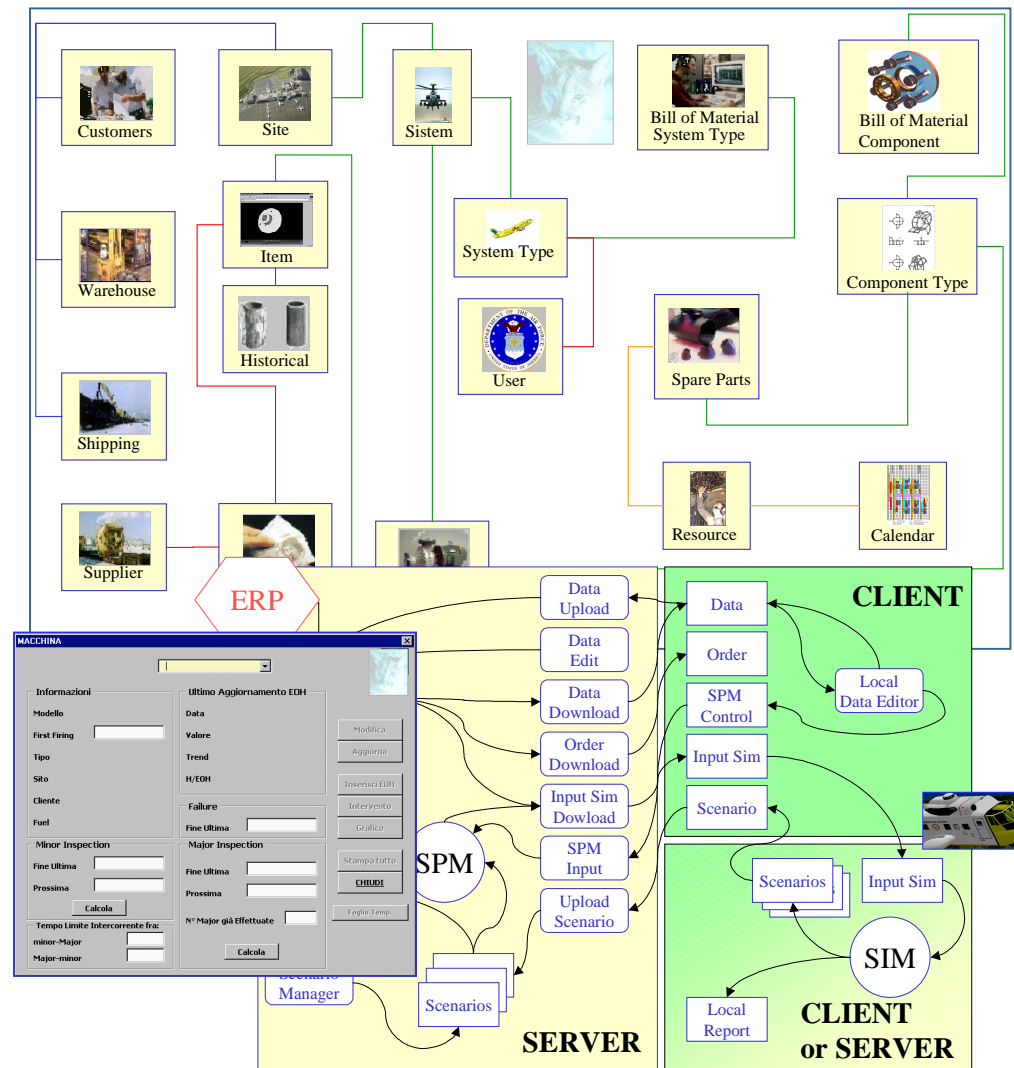
WILD Federation reproduces the supply chain and supports on-line distributed management and control among customers, main contractors, suppliers



# Project: COUGAR

*Controller & Organizer for Ultimate Government of Availability and Reliability*

COUGAR is the innovative system for the Service and Maintenance of complex systems (i.e. Helicopters). The system is designed to satisfy the requirements connected with the maintenance management of helicopters taking care of both pre-planned and emergency actions.





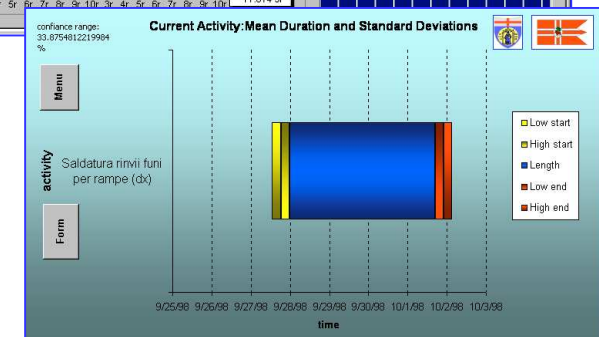
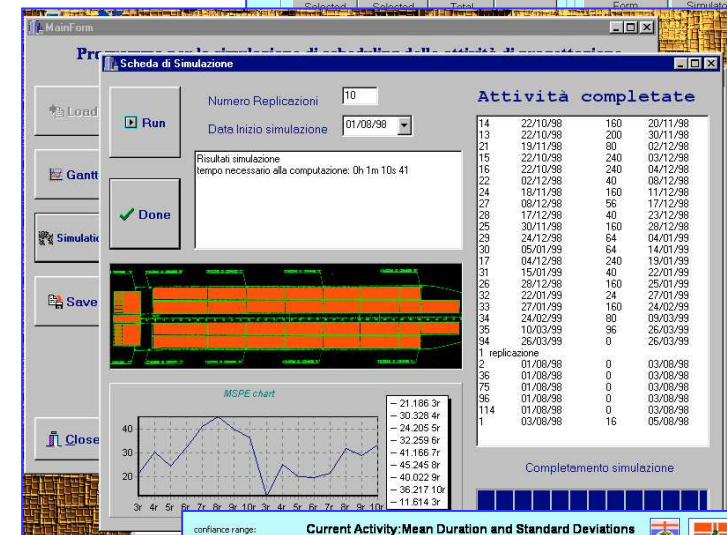
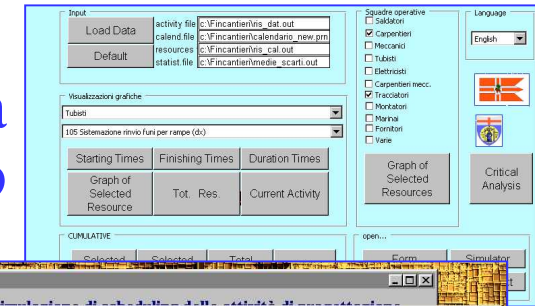
# Project: ProSim 2000

*Project Management Simulation System*

The project is a joint venture between Genoa University and Fincantieri, the major Italian Ship Yard Construction Company.

The project was tested in relation to their new generation of commercial ships: fast ferries for the car deck systems involving impact of R&D and prototyping issues.

ProSim has been already successfully applied to traditional ship construction problems for military ships and now is fully integrated with existing Project Management Software



# 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*



# Project: ROSES

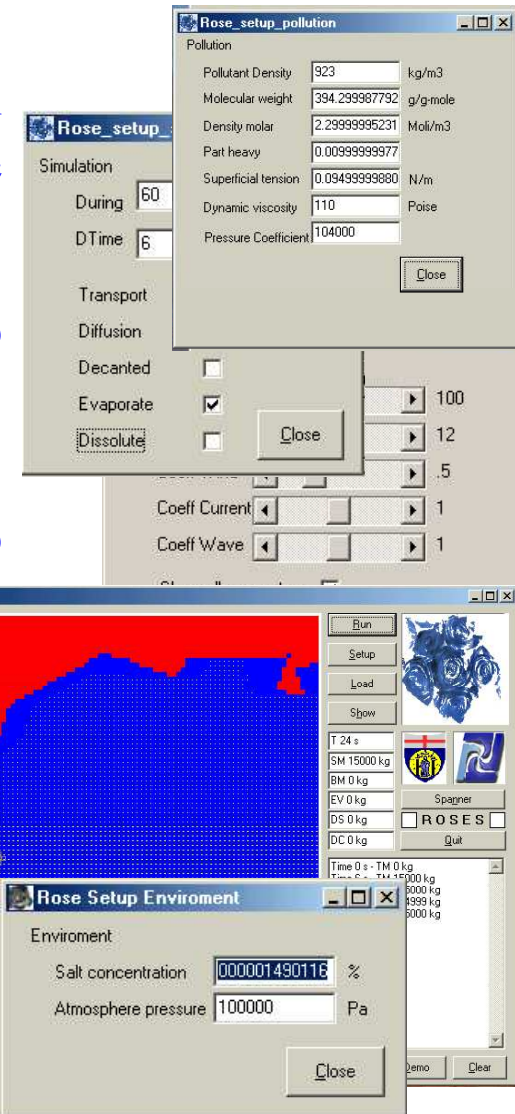


*Reaction to Oil Spill Emergency and Simulation*

The project is devoted to create an Oil Spill Simulator for CETENA including countermeasure models.

The Simulator was validated in relation to historical data available from previous cooperations (i.e. MESA, Kuwait University, etc.) and existing databases (i.e. Istituto Idrografico Italian Navy) in order to guarantee the result fidelity.

Roses reproduces both the oil spill physical phenomena and the countermeasures actions in order to provide estimations about risks, policy effectiveness and standing operating procedures.



# Project: SITRANET

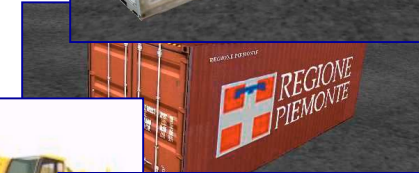
*Simulation for TRAiNiNg & Education in Transportation*

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
- Contstacker Simulator
- Truck Simulator

The project technology leadership is assumed by DIP, while the overall coordination of courses is directed by CFLI



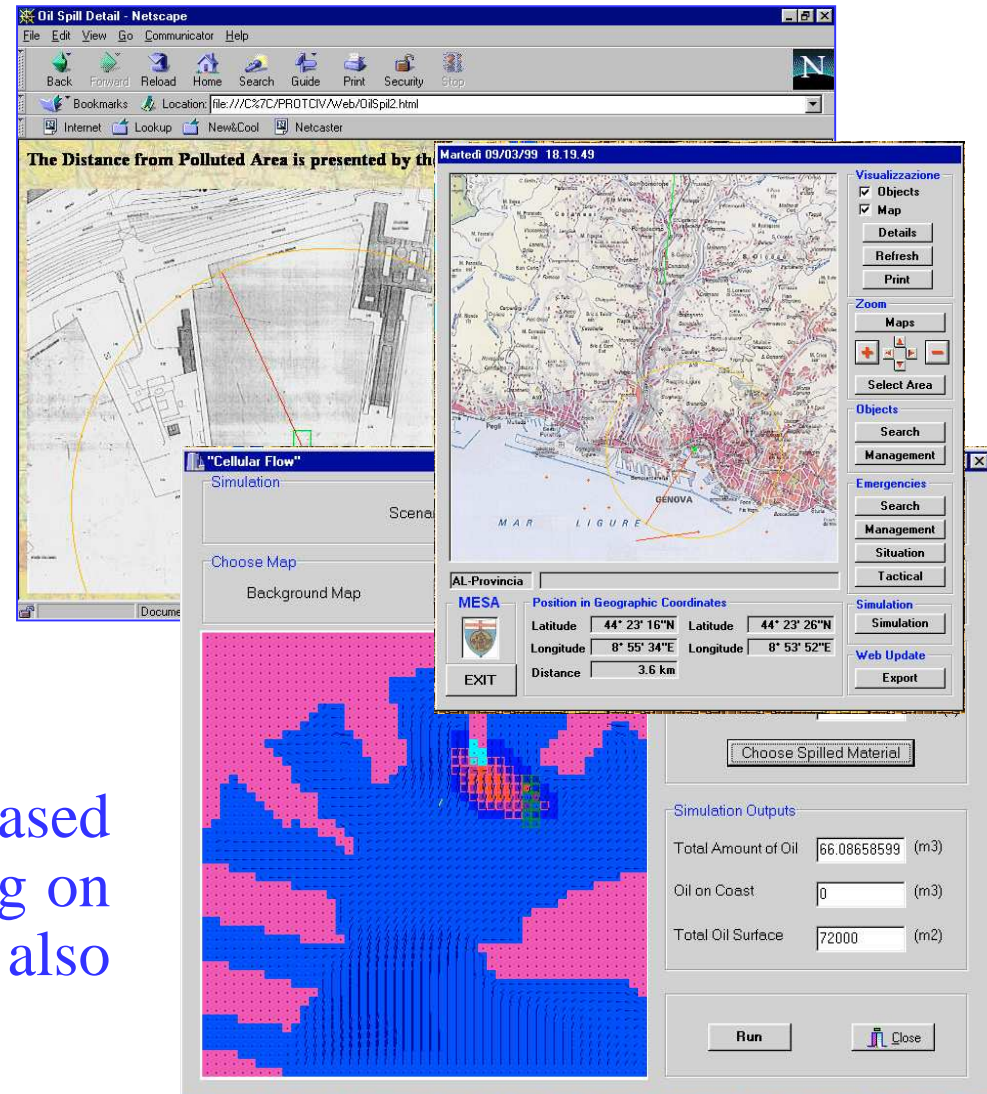
# Project: MESA

*Maritime Environment for Simulation & Analysis*

MESA is an integrated environment to perform simulation and risk analysis in ports and maritime sector.

The package is devoted to support port organizations, entities and operators in Emergency & Environmental Management.

MESA is a modular system based on combined simulators running on PC and providing direct output also on WWW servers.

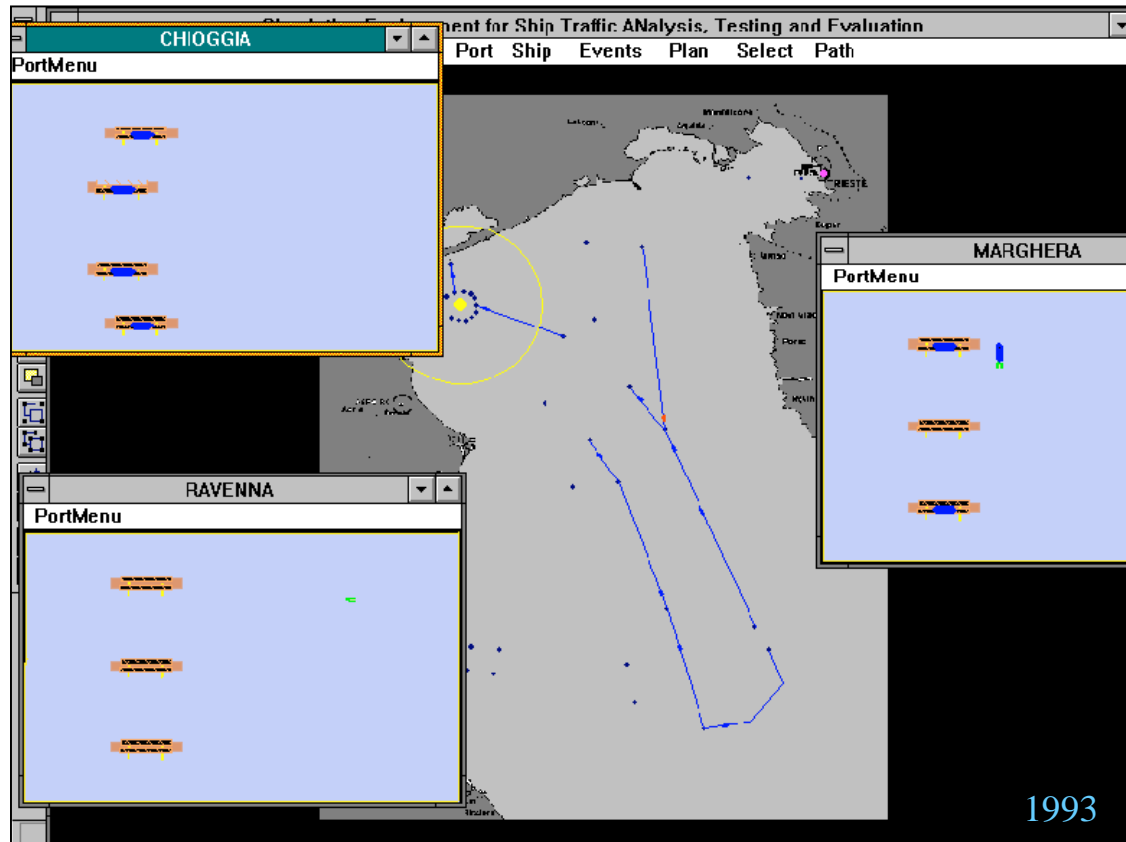
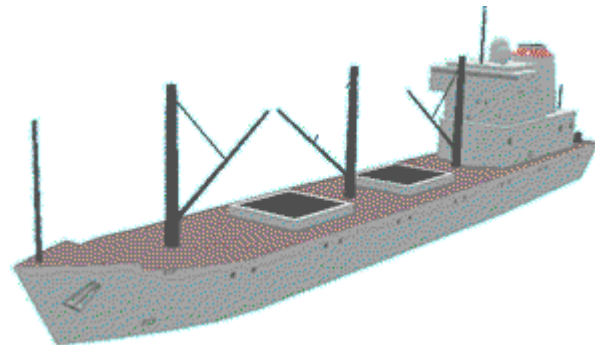


# Project: SESTANTE

*Simulation Environment for Ship Traffic Analysis, Testing & Evaluation*

The project supports the simulation of Maritime traffic in a wide area (i.e. Mediterranean Sea) by using Object Oriented Models.

SESTANTE allows to compute the flows and delays related to strategic investments over ports or maritime lines.



# Project: POSEIDON

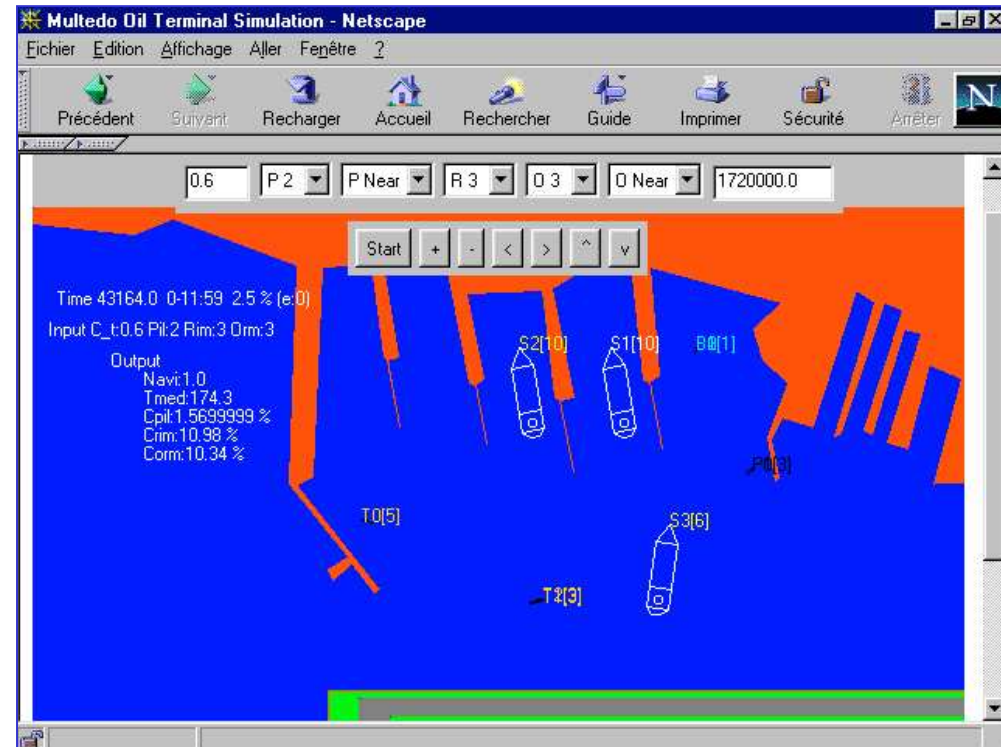
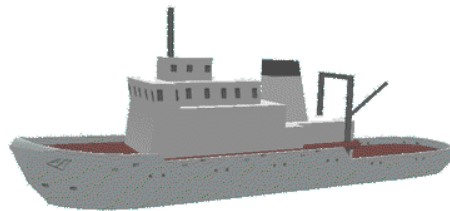
*P*Ort Simulation Environment for Design of Operation and Network

This Project involves a web based, stochastic & combined (discrete & continuous) simulator.

The implementation is made by using Java, the demo is available at:  
<http://st.itim.unige.it/liophant/projects/poseidon>

## Multedo Oil Terminal - Genoa

- Vessel Traffic System
- Tankers
- Docks
- Pilot Boat
- Tugs
- Mooring Men Boats



# Project: LOGOS

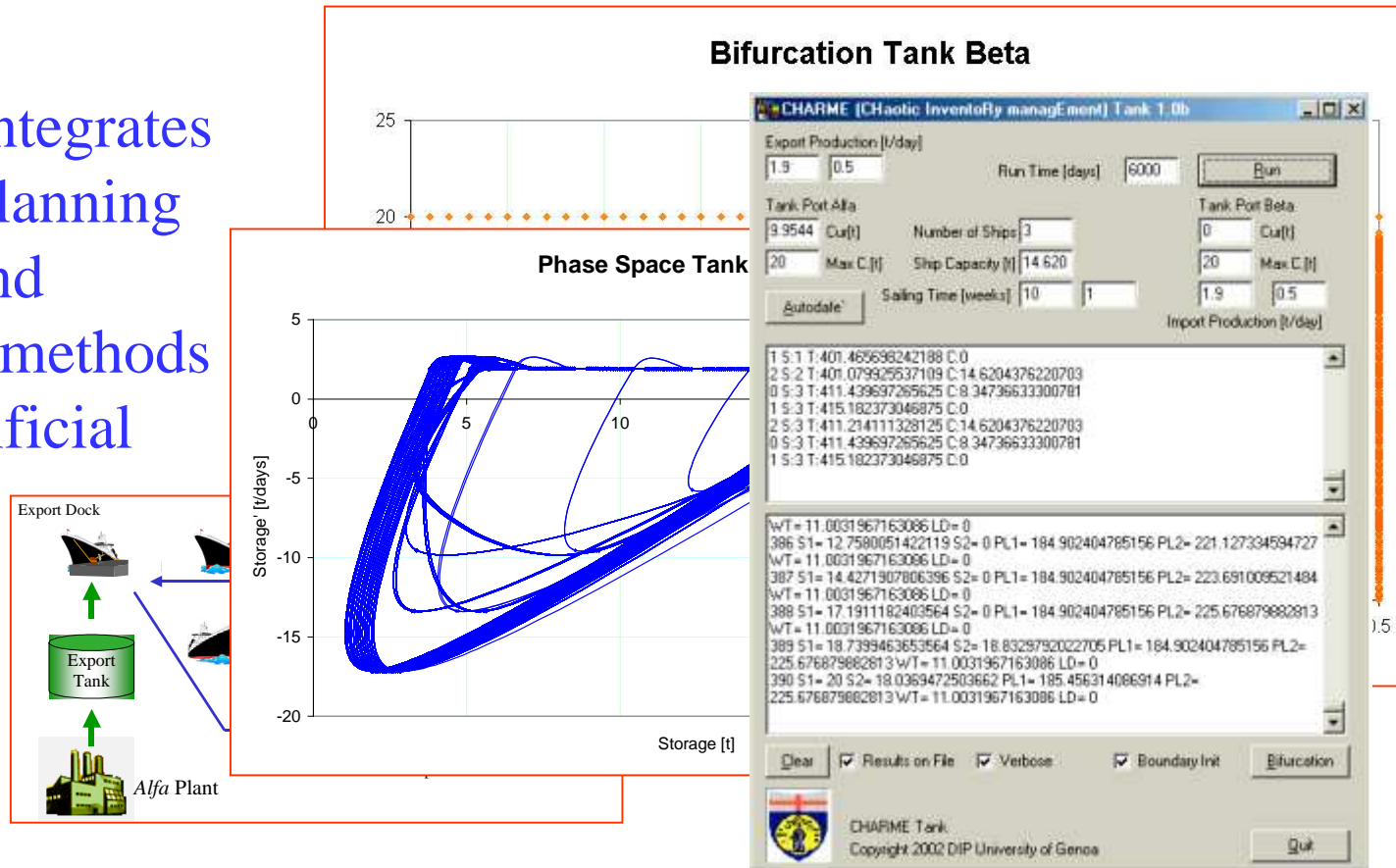
Logistics Optimisation System



EniChem

The project is devoted to optimize the fleet management of ships for chemical products in a wide geographic area.

The project integrates simulation, planning scheduling and optimization methods based on Artificial Intelligence Techniques.



# Project: CHARME

*CHAotic inventoRy ManagEmEnt*

CHARME is a set of modules developed by DIP/Liophant as dynamic reference for VV&A (Verification, Validation and Accreditation) of LOGOS Decision Support System for Fleet Management (Planning, Scheduling & Simulation) in large chemical industries. CHARME uses chaos theory approach in application to real stochastic logistics networks.

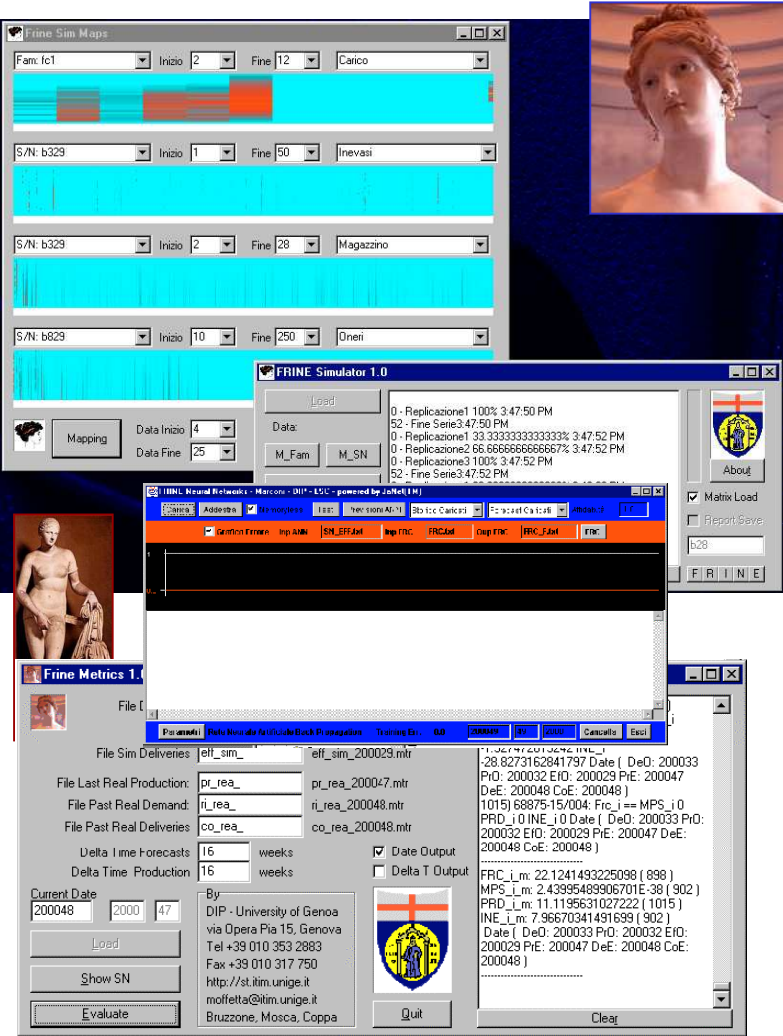
The screenshot displays the CHARME (CHAotic inventoRy managEmEnt) Tank 1.1b interface. It includes a control panel for 'Export Production [t/day]' (set to 4) and 'Run Time [days]' (set to 60). Parameters for Tank Port Alfa and Tank Port Beta are shown, including loading speeds, number of ships, and capacities. A list of simulation results is provided, such as '0 S:1 T:60.5737838745117 C:0'. Below this, a 'Sequencer 1.0b' window shows a route map with ports 1-6 and flow data (e.g., F14 GLFW:900- from:1 to:4 \*\* 2 Done). A small graph titled 'Tank Beha' shows a fluctuating line chart. The interface also features logos for Unige&LSC, A. Bruzzone, A. Orsoni, S. Viazzo, DIP, Liophant Simulation Club, and GFI Consulting.

# Project: Frine

*Forecasts Robust INtelligent Evaluator*

FRINE is a modular approach for supporting inventory management, purchasing and outsourcing planning in telecommunication production industry.

FRINE includes: Frine Sim a detailed simulator for evaluating different scenarios, Frine ANN an intelligent forecast system based on Artificial Neural Networks and Commercial Data Fusion and a Frine Metrics for on-line performances measuring and controlling.



# Project: PUMA



*Project for Ultimate Maintenance in Ansaldo*

PUMA is the innovative system for re-organizing Gas Turbine Service in Ansaldo Energia.

The system allows to manage resources, spare parts, internal/external warehouses, shipping and scheduling of all the maintenance operation for over 50 power plants distributed world-wide.

**PUMA DATA SERVICE**

**PUMA**

SELEZIONE ASSE: MIRFA\_T6643

**PUMA Simulator**

File Output  
 Brogliaccio  
 Controllo Mese  
 Item Mese  
 Ordini  
 Macchine Mese

Carica Dati  
Parametri  
Simulazione

Brogliaccio  
Macchine  
Visualizza  
Esci

Onere Magazzino Ansaldo. (Lit/Mese) 1.2067414  
Onere Magazzino SRI. (Lit/Mese) 34607512  
Onere Pezzi in Viaggio. (Lit/Mese) 6681925  
Costo Pezzi Installati. (Lit/Mese) 12310192  
Costo Handling. (Lit/Mese) 51250288  
Costo Spedizione. (Lit/Mese) 37429912  
Costo Stock - Dut. (Lit/Mese) 25235000  
Numero Blocchi. (N/Mese) 1  
Costo Recoling. (Lit/Mese) 0  
Giorni Fermo Macchina. (gg/Mese) 17  
Numero Ordini 36087  
Simulazione al 42%

Giorni 35749 Data 10/9/2000

- BALLYLUMFORD1
- BALLYLUMFORD2
- BALLYLUMFORD3
- BARRY
- BEDDAM12
- CARRASCO1
- CARRASCO2
- CASSAND
- CHANIA1
- CHANIA2
- FERRARA1
- FERRARA2
- GHANA1
- GHANA2
- ISAB1
- ISAB2
- JEBELAL15
- JEBELAL16
- JEBELAL17
- JEBELAL18
- LIBERTY
- MEGHAGAT
- MEJONES
- MIRFA1
- MIRFA2
- MIRFA3
- MIRFA4
- NOVARA
- SAMALKOT
- SERVOLA
- SOLWAY1
- SOLWAY2
- TERNI
- TEVERGLA1
- TEVERGLA2
- ZAHFRANY

Stati Operativi Macchina

- Ferma
- Avvio
- Marcia
- Ferma Minor
- Ferma Major
- Ferma Guasto
- Inizio Minor
- Inizio Major
- Inizio Riparazione

Il Form "Magazzini" permette di avere una fotografia dei Magazzini in ogni istante di tempo, evidenziando per ogni Item la quantità presente, la Scorta Minima di Sicurezza e il Tipo di Item.



# Project: VAED

*Virtual Aided Engineering & Design*

VAED is a joint cooperation between Genoa University and Ansaldo for the development of Distributed Synthetic Environment for Power Plant Design.

A prototype has been developed and used for supporting design of Burners, Piping, DCS of a Gas Turbine in joint project with Siemens.

A set of demonstrators has been implemented and tested to support Project Management applied to these projects.

The collage displays several software interfaces:

- PERT Event Slack Time - Netscape:** A PERT network diagram showing activities (A-H) with their respective durations and slack times. The critical path is highlighted in red.
- Exercise: PERT Event Slack Time - Netscape:** A simulation window showing a network diagram with nodes and edges, and a status bar indicating 'Mode: Student' and 'Total Time 0 / Grade: 77/30'.
- SUMBA - Netscape:** A table listing project tasks and their status.
- 3D Models:** Two 3D CAD models of turbine components, one showing a cross-section of a turbine housing and another showing a gas turbine engine.

Building	Ingegneria	Fornitura	Montaggio	Avviamento
Electrical Boards				
Medium Voltage				
Low Voltage				
UPS (Uninterruptible Power)				
Distrib. Control System (DCS)				
Cable Trays				
Cable Pulling				
Cables				
Civil Works				



# Project: LEM

*Logistics Evaluation Model*



LEM Project is a joint venture among Ford, Boston College, LSC & Genoa University for Developing a Web Based Support System for Supply Chain management.

Tests using LEM beta\_modules have been carried out successfully on over 70 logistics centers.

**LEM MAIN**

Sub Prod : 0.0  
Total : 6.6373188

**Production Lines**

Line ID	Line DAE1	Line DAE2	Line B&S	Line A1	Line A2
Luxury	Compact	Luxury	Compact	Compact	Compact
PS_01	PS_01	PS_02	PS_03	PS_04	
Pittsburgh	Pittsburgh	Clinton	Pocahontas	Florissant	
Initial Max Capacity	500,000	400,000	500,000	750,000	750,000
Productivity Increase	-	-	-	-	-
Theoretical Productivity	500,000	400,000	500,000	750,000	750,000
Current Production	400,000	250,000	200,000	650,000	400,000
Productivity	80%	62%	40%	87%	52%

**Production Supply Chain**

Production Site: PS\_01 Pittsburgh  
Car Model: CA\_02 Car Mago

Overall Efficiency	97%	97%	98%	94%	97%
MTBF	19.0	16.0	19.0	31.0	31.0
MTTR	1.4	1.2	1.4	2.2	2.0
Cost for Improving Productivity	9.78	8.6	9.78	8.8	8.7
Cost for Enabling new Cars same type	150,000	100,000	160,000	140,000	140,000

**Car already Enabled**

Car already Enabled	Line DAE1	Line DAE2	Line B&S	Line A1	Line A2
CA_01	Yes	Impossible	Yes	Impossible	Impossible
CA_02	Yes	Impossible	Yes	Impossible	Impossible
CA_03	Impossible	Impossible	Impossible	Yes	Yes
CA_04	Yes	Impossible	Yes	Impossible	Impossible
CA_05	Impossible	Impossible	Impossible	Impossible	Impossible
CA_06	Impossible	Impossible	Impossible	Impossible	Impossible
CA_07	Impossible	Impossible	Impossible	Impossible	Impossible
CA_08	Impossible	Impossible	Impossible	Impossible	Impossible

Update  
Supplier: SUP\_18 Sp, SUP\_14 To  
Production Frequency: 1.0, 1.1  
Quantity: 274, 1,370  
Warehousing  
Calculate: Distance 233, Transport No. 12



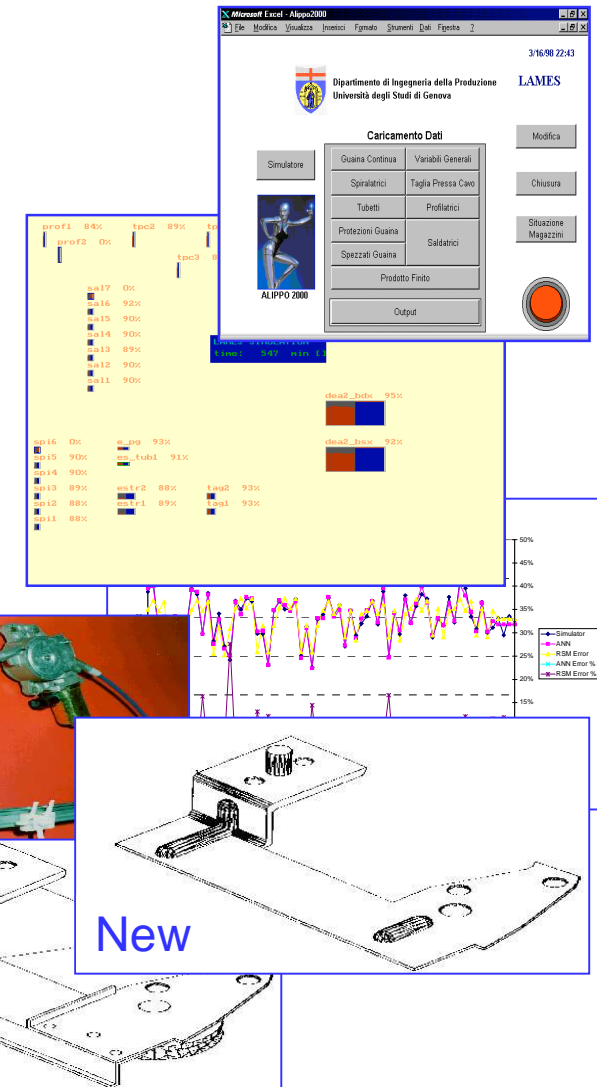
# Project: Alippo 2000/2001

*Virtual Prototyping for Automotive Production & Design*

Alippo Project is the development of a Model for integrating Design and Production Environment in Automotive Component Industry.

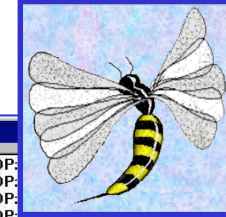
The system connects the Product Design provided by CAD systems (i.e. CATIA) with the Production Processes using Simulation.

Alippo simulates the production system considering the changes and valorizes the design changes in terms of Work in Process, Warehouse Saturation, Effective Productivity etc.



# Project: WORM & WASP

*Work Organization for Railways cargo Management  
Wide Analysis of rail System and Performances*



WORM is a simulator of freight rail operations for estimating service quality and costs.

WASP is a data mining system and smart performance analyzer directly integrated in railways information system.

WASP & WORM are integrated to operate as DSS for ASA Logistics Div. in Italian Railways

The image displays two software interfaces. The top window, titled 'WORM', shows a network diagram of railway lines connecting stations such as Castel Franco, Bologna SD, Faenza, and Imola. It includes a list of train types (Codice) and a control panel with 'Zoom In', 'Zoom Out', and directional arrows. The bottom window, titled 'W.A.S.P. Main', shows a grid of simulation results for different train types and routes, with buttons for 'split sil', 'split spl', 'split vi', 'split sal', 'split sic', 'split spc', 'split ve', and 'split sac'. A 3D model of a yellow train engine is shown in the bottom right corner of the WASP window.

# Project: MASC & DICO-SAP

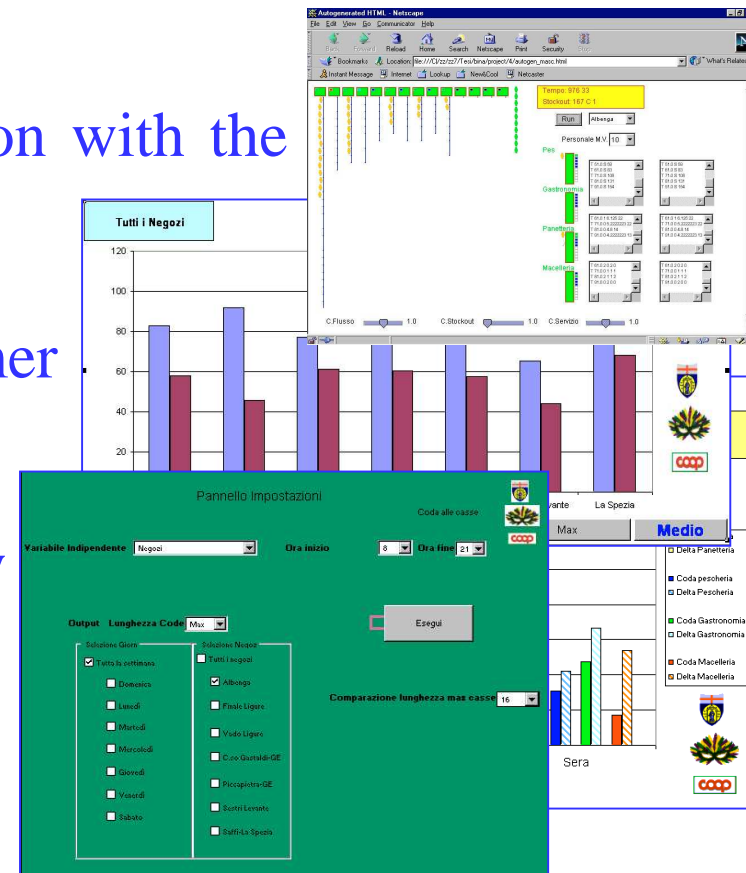
*Modeling & Analysis for Satisfaction of Customers  
DIP-COOP SAP*



MASC is a system for Statistical Analysis, Modeling & Simulation applied to big-distribution chains.

The Project is carried out in cooperation with the major Italian company in this area

The final target is to improve the customer satisfaction acting on policies, operating procedures, resources & equipment; the system is fully integrated with company ERP (SAP R/3) and benefits of similar experiences carried out other companies (i.e. Genoa Mass Transportation Company).

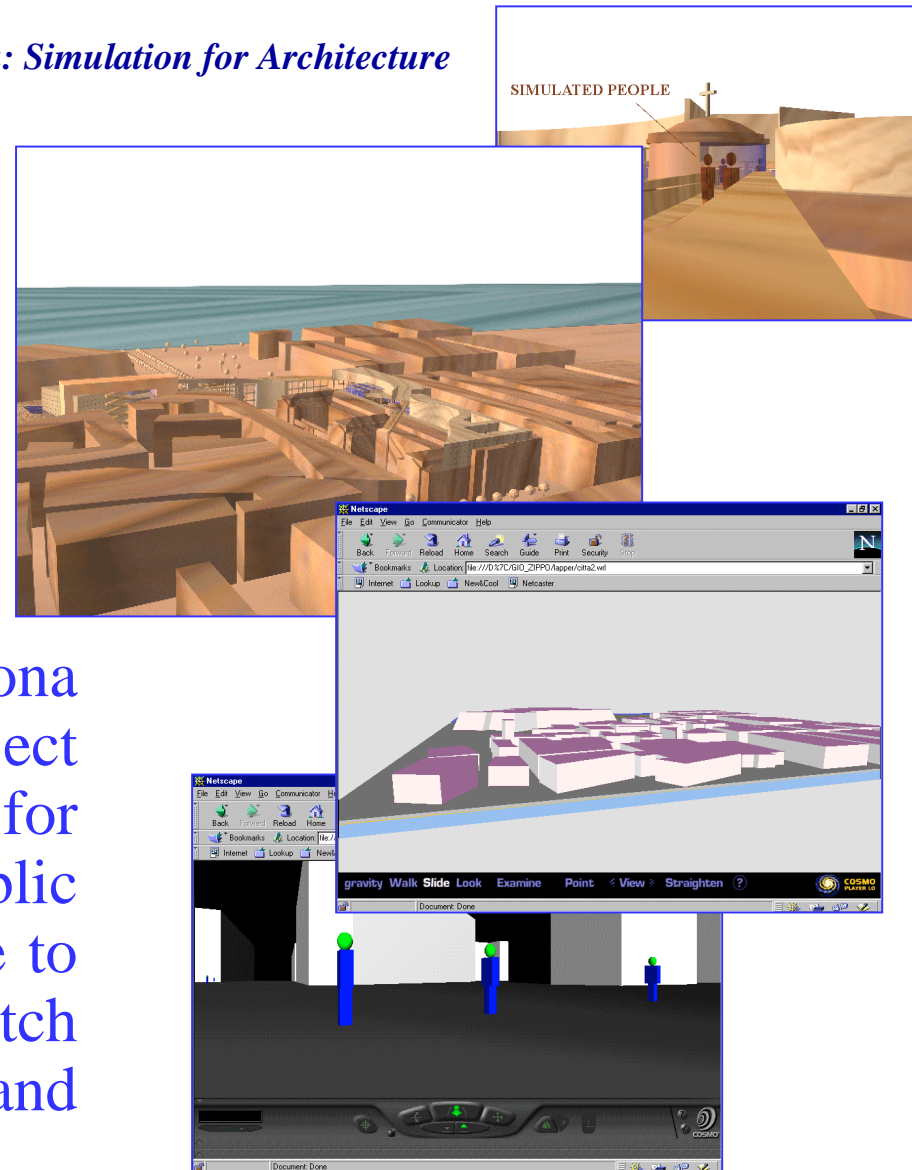


# Project: San Paolo 2000

*San Paolo Hospital in Savona: Simulation for Architecture*

San Paolo 2000 is the integration of simulation with architectural techniques for functional design and analysis of urban areas and buildings.

The system reproduce the Savona Downtown with the restoring project of this building using VRML 2.0 for exploitation of the results in the public community by WWW; it's possible to navigate in the scenario and to watch the interactions of simulated cars and people

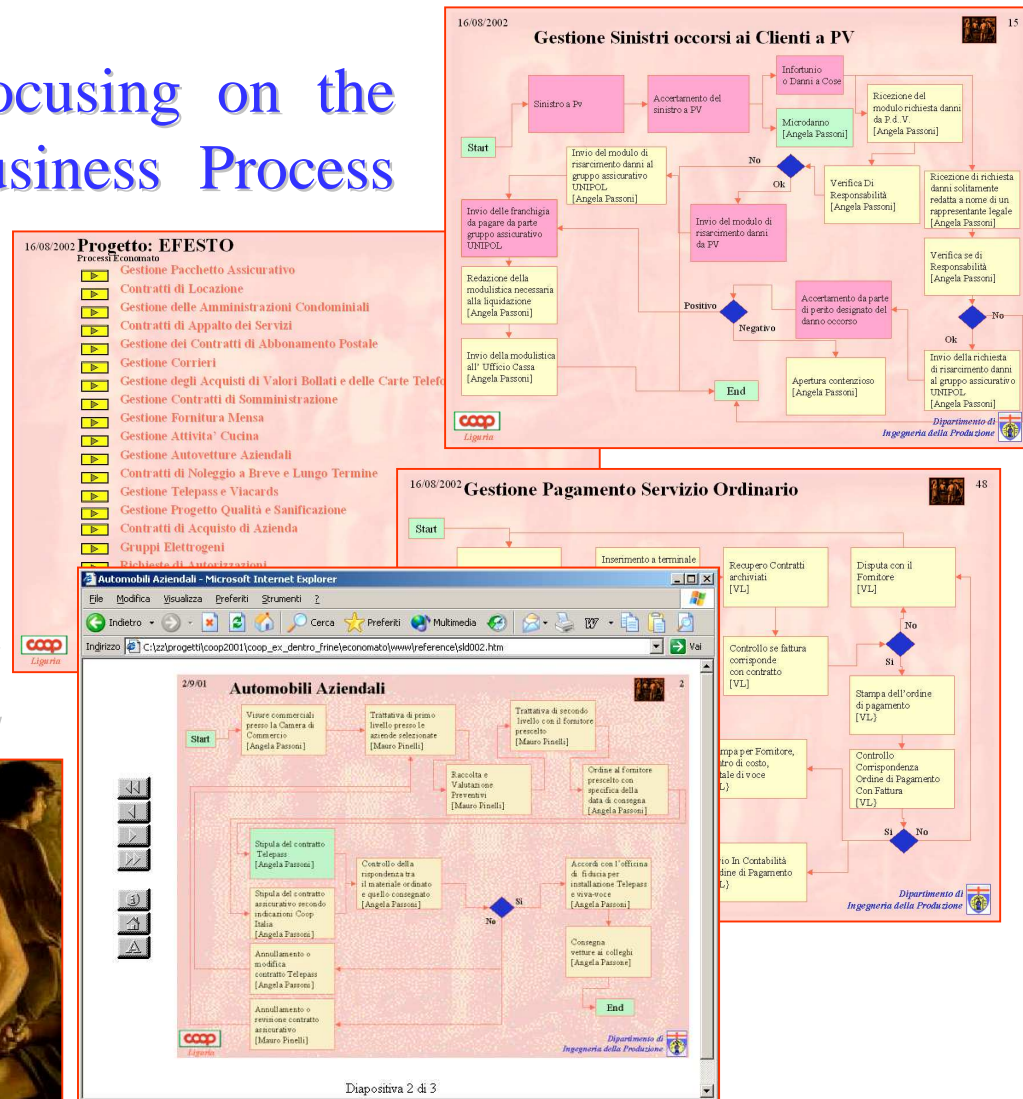


# Project: EFESTO



Elaborazione Flussi Economato Sistemi, Tecniche & Organizzazione

The EFESTO project is focusing on the creation of models for Business Process Re-Engineering integrating simulation techniques. The system allows to integrate PowerPoint™, Access™ and Excel™ with simulation and to distributed the results directly in HTML format in Intranet managing hierarchical process structure.

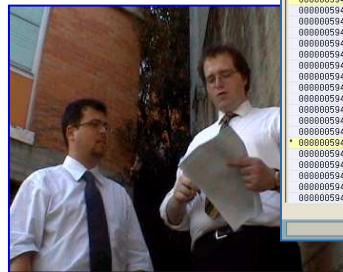


# Project: AVICUNICOLO



Project for Logistic Platform devoted to White Meat Fresh Products

The project is devoted to the architecture definition, system development and testing for a new logistics platform integrated in a large supermarket supply chain. The system was implemented in SAP R/3 Retail 4.6<sup>tm</sup>



The screenshot displays the SAP R/3 Retail 4.6 interface. The top window, titled 'Distribuzione merc: monitor', shows a list of distribution items with columns for 'Set', 'Cat N', 'doc app', 'Pos', 'Op', 'Articolo', 'Plan app', 'Unità Eff', 'Unità MO', 'Qtà CD', 'Unità', 'Qtà AD', 'Unità', 'Qtà Inagg', 'Unità Qtà distr', and 'Unità'. Below this, a table lists various articles and their quantities. The bottom window, titled 'Elaborare lista pianificazione MRP deperibili', shows the MRP planning process with fields for 'Log errori', 'Log di conferma', 'Simulazione', and 'Aggiornare'. It also displays a table of 'Lista pian MRP deperib:' with columns for 'C', 'Articolo', 'Fornitore', 'Qtà ORDAO', 'U.', 'Divisa', 'Unità', 'U.', 'Definizione', and 'Nome 1'. The interface includes standard SAP navigation icons and a menu bar at the top.



# Project: DISPOS

*Disponibilità di Impianti di Scasellatura POStale*

DISPOS is a suite devoted to certify availability and reliability in complex postal Production Lines characterized by multiple operative configuration. DISPOS integrates historical data with *a priori* analysis based on simulation. The systems include references to the international regulations (i.e. CQA UNI 9910, FEM 9.221, NASA TM4628A, DR01-3 DR01-27, NASA LeRC r4, MIL-STD-1388-2B, MIL-STD-49506)

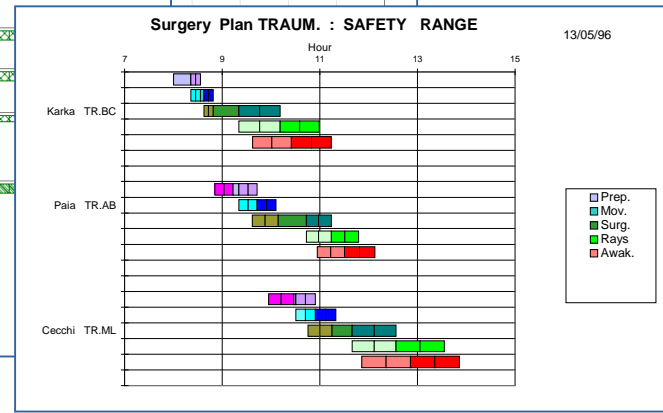
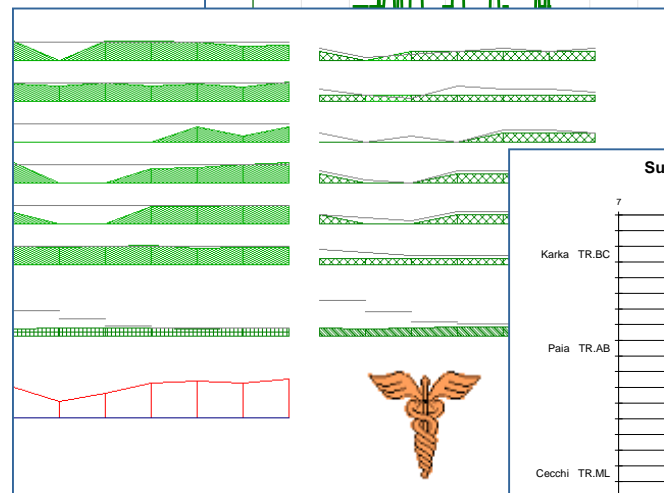
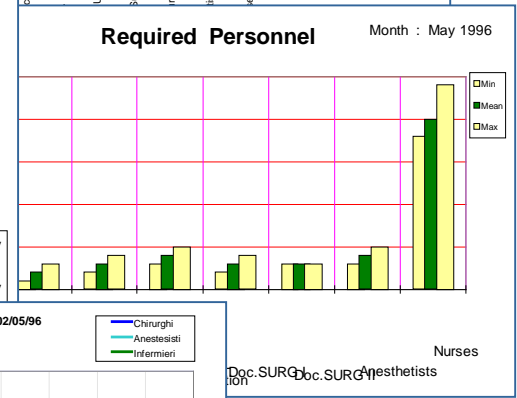
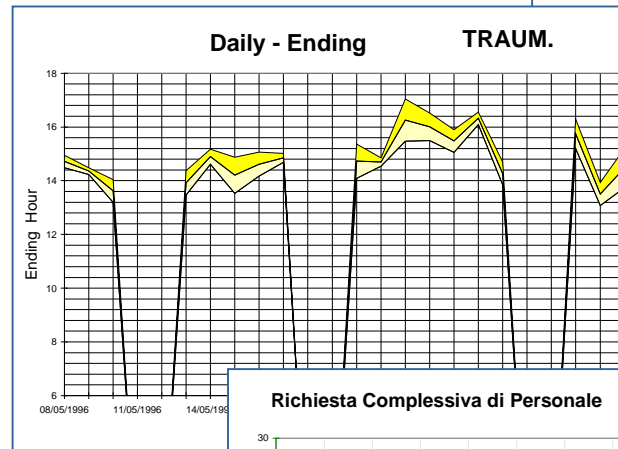
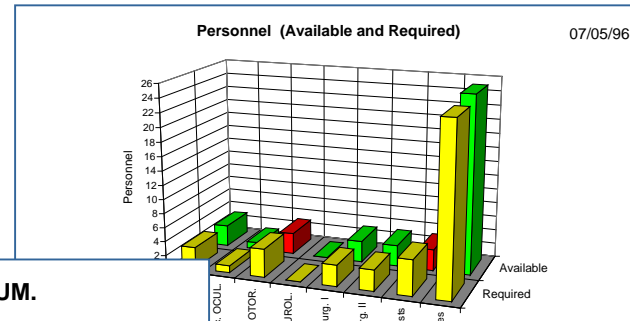
The screenshot displays the DISPOS software interface, which includes several key components:

- Top Panel:** A menu bar and a toolbar with various icons for file operations and simulation control.
- Left Panel:** A navigation tree showing the project structure, including folders for 'DIP' and 'Universita' degli Studi di Genova'.
- Main Area:** A large data table with columns for various parameters such as 'ISS1', 'LSF1.1', 'STAR1', 'LSV1', 'STR1', 'SIACS1', 'SIACS2', 'SISC', and 'STRH'. The table contains numerical values and percentages, such as '98.46%', '98.02%', and '99.326%'. There are also smaller graphs and charts integrated into the table cells.
- Right Panel:** A 'Posiplaf 1.0' dialog box with a 'Calendar' and 'Time' section, and a 'Posiplaf 1.0 - Graph' window showing a 3D visualization of a postal production line with various components labeled (e.g., STR1, ISS1, LSF1.1, STAR1, LSV1, STR2, ISS2, LSF2.1, STAR2, LSV2, SISC).
- Bottom Panel:** A control panel with checkboxes for 'Fit Stop Maintenance', 'Concurrent Failures', 'Graph On', 'Verbose', 'Log', and 'File Saving'. It also includes dropdown menus for 'MTBF Distribution' and 'MTTR Distribution', and a 'Close' button.

# Project: HOSSIAN

*Hospital Simulation Analyzer*

HOSSIAN is a tool developed to support resource planning in Hospital by integrating simulation and AI (Artificial Intelligence). The system has been successfully applied to the personnel and equipment scheduling in a Surgery Division composed by 6 operative rooms.



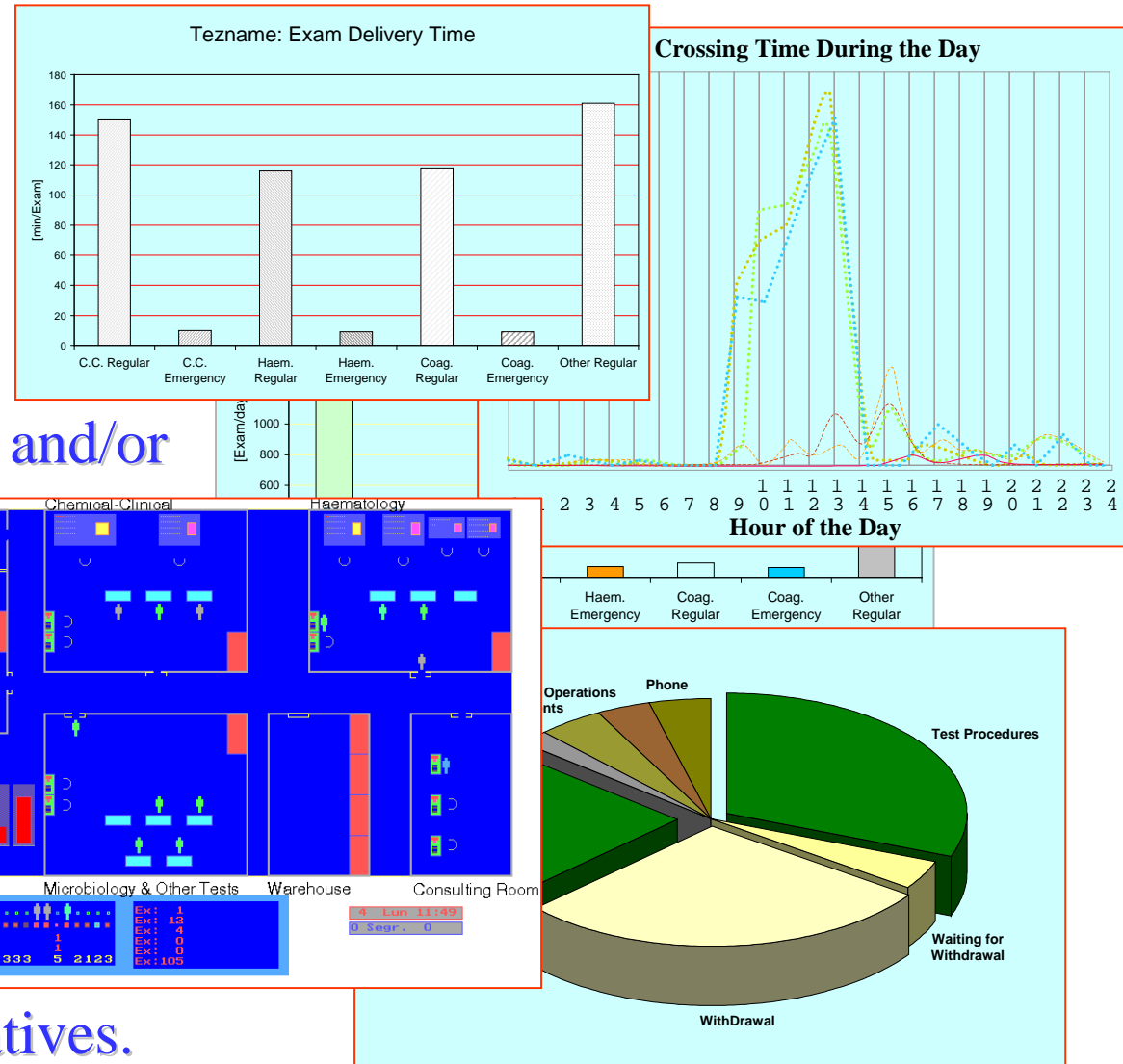


# Project: TEZNAME

*Tactics Evaluation & optimiZatioN for Analysis in Medical Environment*

TEZNAME is a tool for analyzing Hospital Departments Management considering the detail of each resource, individual and/or procedure.

The system has been successfully applied to Laboratory Re-engineering to compare different investments and policy/organization alternatives.



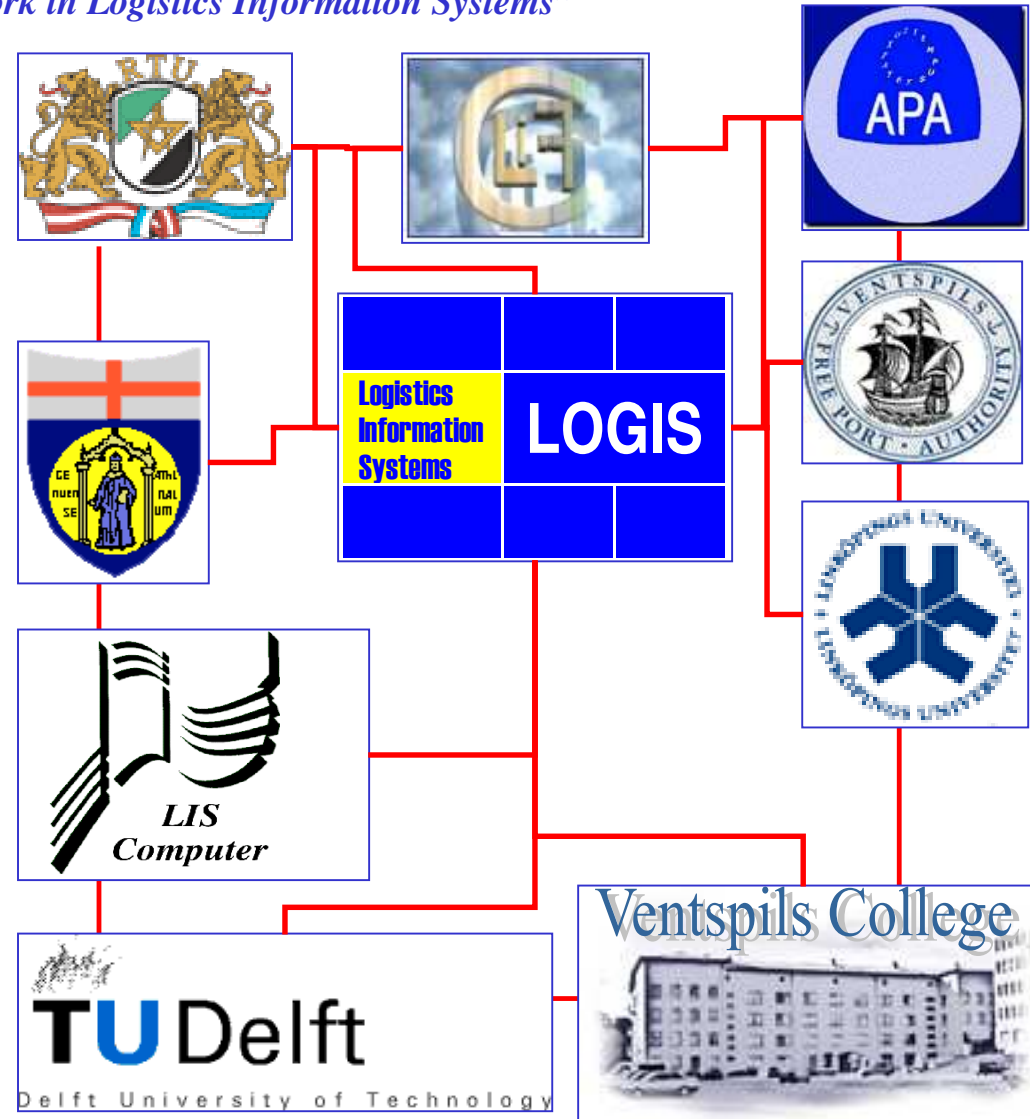


Sponsored by  
European Community

# Project: LOGIS

*“Long-distance tutorial network in Logistics Information Systems”*

LOGIS is a *Leonardo* project sponsored by European Community in order to develop Long Distance Tutorial Network in "Logistics Information System", Based on WEB Technologies. Besides the training, an interesting exploitation of the results of the research is related to the transfer of these techniques to Small - Medium size Enterprises.



# Project: IEPAL



*Intensive Educational Program in Advanced Logistics*



IEPAL is a Co-funded project sponsored by European Community and US Department of Education, to live an academic & industrial training, to compare European and US way of living and working. A goal of this project will be the integration & exchange of different culture, the application of Web instrument and mobility to learn to cooperate. It is a Great Opportunity for engineering students and their curriculum to experiment in the new millennium Transatlantic Experiences in Enterprises and Universities working on Projects in **World-Wide Distributed Teams** focusing on the **Advances in Modeling & Simulation for Logistics and Supply Chain Management.**



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Dip-Unige



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Consorzio di Formazione Logistica Intermodale



National Center for Simulation



MISS - DIP University of Genoa



Liophant Simulation Club



# Conclusions

San José

SCSC 2004



The Liophant Simulation Club and DIP-MISS are acting 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 DIP-MISS organizes Conferences and International Workshops focusing on application of Modelling & Simulation; for instance, this year: Summer Simulation in California HMS2004 in Rio de Janeiro and MAS/I3M on the Italian Riviera.

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



# References



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