

Logistics in a Challenging World: Opportunities in a Challenging World for Companies & Young Engineers



*Academia, Industry
& Students
Get -Together*



Meeting Program

Savona Campus of Genoa University
June 8th, 2012

- 9:30 Welcome Prof. Agostino G.Bruzzone, Director M&S Net
- 10:00 Logistics & IT Director Presentations (i.e.Dr.R.Totobrocchi CRAI)
- 11:30 *Game On Logistics Organization and Management*
- 12:00 Company Executive Interaction with Students in the Campus
- 12:30 Closure



Free Attendance, Please Register by email to:
alberto.tremori@simulationteam.com



Campus Universitario di Savona

www.campus-savona.it

SPES



Università degli Studi di Genova

for Further Information & Venue Details: massei@itim.unige.it www.liophant.org/siren/2012/logistics

Logistics in a Challenging World: Opportunities in a Challenging World for Companies & Young Engineers



*Academia, Industry
& Students
Get -Together*



Meeting Program

Savona Campus of Genoa University
June 8th, 2012

- 9:30 Welcome Prof. Agostino G.Bruzzone, Director M&S Net
- 10:00 Logistics & IT Director Presentations (i.e.Dr.R.Totobrocchi CRAI)
- 11:30 *Game On Logistics Organization and Management*
- 12:00 Company Executive Interaction with Students in the Campus
- 12:30 Closure



Free Attendance, Please Register by email to:
alberto.tremori@simulationteam.com



Campus Universitario di Savona

www.campus-savona.it

SPES



Università degli Studi di Genova

for Further Information & Venue Details: massei@itim.unige.it www.liophant.org/siren/2012/logistics



Logistics: Looking to Infrastructures & Processes



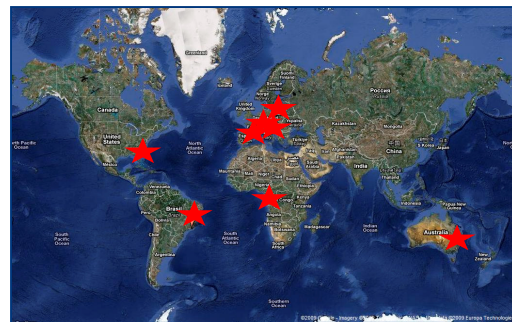
Simulation Team MISS DIPTTEM is a center of excellence on logistics solutions and provide opportunities to discuss on these issues





Simulation Team

Universities, Research Centers and Companies operating worldwide in synergy for developing Innovative Solutions with a particular focus in Modelling and Simulation





McLeod Institute Simulation Science M&S Net Genoa Center



Email: agostino@itim.unige.it

URL: www.mcleodinstitute.org
www.m-s-net.org

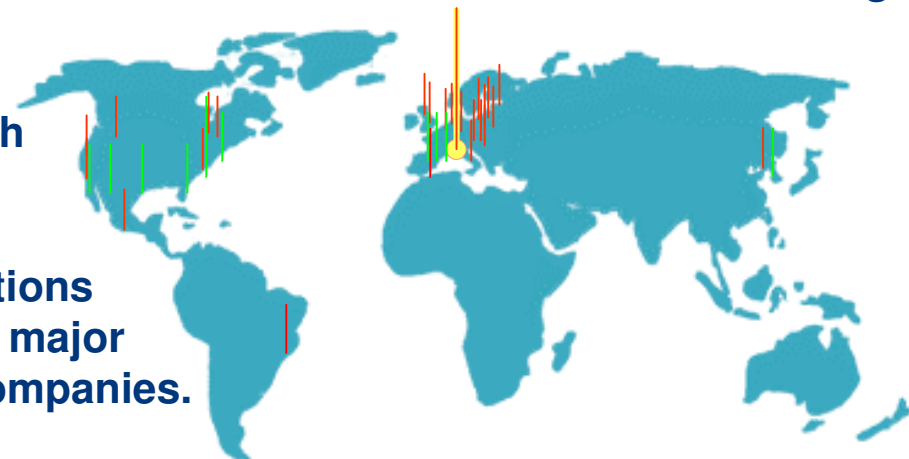


The research group of DIPTTEM of *Genoa University* is active from '60 in Simulation applied to Industrial Engineering and is part of MISS and M&S Net

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

- | | | | |
|-----|------------------------------|------------------------|------------------|
| as: | Chemical Facilities | Power Plants | PM |
| | Harbor Terminals | Environment | Business |
| | Manufacturing | Public Services | Logistics |
| | Public Transportation | | |

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.



**28 MISS Centers &
34 M&S Net Centers World-Wide**



Simulation Team

Simulation Team MISS DIPTM

The Simulation Team - DIPTM 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:



**Polimeri
Europa ENI**



**Fleet Management Planning & Scheduling
Chemical Plant Logistics Optimization**



Ansaldo

**Service and Optimization
for Power Plant Design**



**Cetena
Fincantieri**

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



COOP

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



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

- General Director M&S Net (34 M&S Centers worldwide)
- Board of Directors of SCS and Chairman of Technical Chapter
- Member of NATO SAS, MSG and NIAG
- Italian Point of Contact of ISAG (International Simulation Advisory Group)



DIPTM
Università di Genova

Simulation Team 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 Courses on Engineering, Communication Science, Medicine, Gyms, Economy and Education; new laboratories have been realised by different groups (Simulation Team Mobile Labs & HLA Lab, Combustion Lab, SIRE, CIMA Labs)



 **Campus Universitario di Savona**
www.campus-savona.it SPES S.p.A.  Università degli Studi di Genova



PREMITELE Program

*Preparation for Management within
Innovative Transportation services and Evolving Logistics*



PREMITELE Program (Preparation Business Management, Transportation and Logistics) was established to provide Methodologies and Tools for Transportation Services and Logistics with special attention on the following issues:

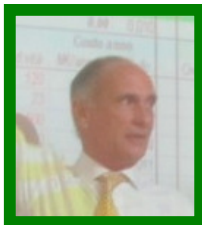
- *Assessment and Forecasting of logistics demand while facing emerging behaviors and new trends*
- *Definition of Evaluation criteria and solution for Supply Chain Management (SCM)*
- *Planning and Management of transport and logistics services*
- *Technology Transfer and Skill Acquisition on logistics considering operations, economy, legal aspects, engineering*
- *Identification of customer needs*
- *Use of Models and Tools for operative, economic & financial analysis and evaluation of investments and management solution for transport infrastructures and logistics*
- *Marketing planning for new transportation services and logistics*
- *Development of systems of management and control for Logistics and SCM*
- *Support and Guide the public administrators and operators in decision making and in the definition and implementation of realistic and effective policies in Transportation*

The aim of the course and then PREMITELE the preparation of a new generation of experts that who could be valuable in business within the area of Logistics and Transportation Services, becoming the new leaders in this area to support developments and strategic decisions and their implementation. People involved in the program should have skills in the fundamentals of engineering, economics, and regulatory and procedural issues related to transport and logistics characteristic within their university education; the attendees are students of Engineering, Economics or Law Faculties with Genoa, Rome, Bologna, Trieste, Salerno Universities. The PREMITELE is founded by the Italian National Department of Transportation.





Industrial Guest



Rolando Toto Brocchi
Director for Logistics and IT|
CRAI Secom spa





Who's Who *Agostino G. Bruzzone*



- Basic Engineering Studies in Italian Naval Academy, Pisa and Genoa University
- Mechanical Engineer
- Expert in Modelling & Simulation, Project Management, Operation Management, Industrial Plants & Logistics
- Expertise as Consultant and in Industry, Military Service and Academia
- Experience in Projects with Major Companies (i.e. IBM, LMC, Boeing, Fiat Group, COOP, Ansaldo, Selex, Solvay) and Agencies (i.e. Italian Navy, NASA, DGA, DoD, etc.).
- Full Professor in DIPTTEM, University of Genoa
- Visiting Professor in Several Universities in North & Latin America, Europe, Australia, Africa and Asia
- World Director of the M&S Net (34 Centers worldwide)
- Director of McLeod Institute of Simulation Science Genoa
- Project and Program Manager in R&D Projects and Joint Ventures with Industries and Agencies for several USD millions within last 10 years
- Director of the Master Program in Industrial Plants ("Impiantistica Industriale") for Genoa University.
- Founder and President of Liophant





Logistics & Transportation in a Two-Speed World:

The crisis pointed out by Media is very relative in term of Geographic/Temporal Coordinates for Instance:

- **Automotive Vehicles: +17% Worldwide from 2006 to 2010**
- **Shipbuilding:**
Europe from 8% of World Market to 3% (-60%)
2011: 200 Ship in Construction just in Shanghai Area

GDP:



2010: Europe	1.5%	Italy	1.3%
USA	2.8%	Canada	3.1%
China	10.3%	India	10.4%
Brazil	7.5%	Chile	5.3



Car Production 2006 to 2010

1	China	351.5%
2	Argentina	178.2%
3	Slovakia	155.1%
4	India	122.7%
5	Indonesia	112.7%
6	Thailand	99.7%
7	Egypt	92.0%
8	Iran	88.6%
9	Romania	85.4%
10	Czech	78.4%
11	Uzbekistan	49.0%
12	Poland	45.4%
13	Slovenia	45.3%
14	Brazil	40.7%
15	Mexico	40.4%
16	Serbia	38.3%
17	Turkey	33.0%
18	Malaysia	29.0%
19	Other	22.8%
20	South Korea	15.2%
21	Russia	13.1%
22	Hungary	11.1%
23	Germany	3.8%
24	Japan	-7.9%
25	Spain	-8.8%
26	South Africa	-9.1%
27	Portugal	-16.7%
28	UK	-20.4%
29	Italy	-21.0%
30	Taiwan	-22.3%
31	Canada	-28.6%
32	Australia	-35.1%
33	USA	-36.8%
34	France	-38.2%
35	Sweden	-38.7%
36	Belgium	-40.9%
37	Netherlands	-58.3%
38	Ukraine	-61.7%
39	Austria	-62.6%
40	Finland	-69.9%



Logistics as *Periodic* Source of Risks and Opportunities

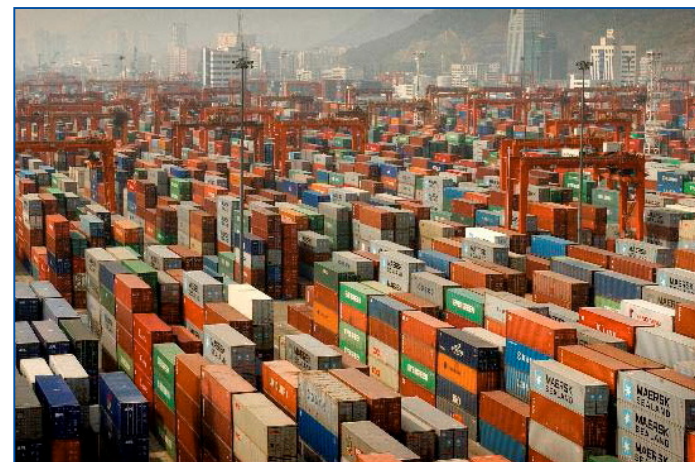
The Logistics exploded during the last 20 years due to globalization, therefore due to the market evolution this situation is characterized by periodic behaviors with very challenges oscillations, where M&S could support decision making:

Dry Bulk (Cape Ship) Rates along

~10 kUSD/Day 2006
 >100 kUSD/Day 2007
 ~4 kUSD/Day 2008
 5-60 kUSD/Day 2010

Shipping Containers Europe to China

from - 2'000 Euro/TEU
 to + 20 USD/TEU



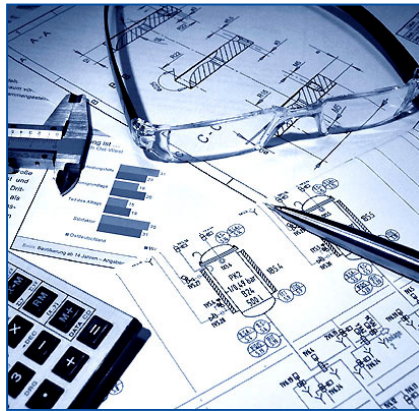


Humans & Globalization

Workers, Employers, Engineers & Managers are people and subjected to the world market evolution; therefore the capability to move and reorganize effectively such realities could get big benefits from modeling & simulation

Plant Engineering Prices
Italy 20-30 Euro/hour
Brazil 15-20 Euro/hour
India 5-10 Euro/hour

Ship Construction Yard Workers
Italy 2'500 Euro/Month
China 350 USD/Month
Korea 500 USD/Month
Philippines 400 USD/Month



Industrial Plant Engineering Sector 2011

Indicative Data from Web Sources



Ship Industry 2011

Copyright © 2012 Agostino Bruzzone, MISS DIPTM University of Genoa





Challenges & Opportunities for Companies & New Graduates

Companies, even in Italy, have to face the challenges, therefore some results are interesting and there are opportunities everywhere and everytime:

ENI	Revenues +12%	Profits 8.3GUSD	+37%	23rd World Company (previously 24th)
Generali	Revenues -4.6	Profits 2.2GUSD	+23%	33rd World Company (previously 19th)
ENEL	Revenues +8%	Profits 5.8GUSD	-22%	56th World Company (previously 60th)
EXOR	Revenues +7%	Profits 181MUSD	na	83rd World Company (na)



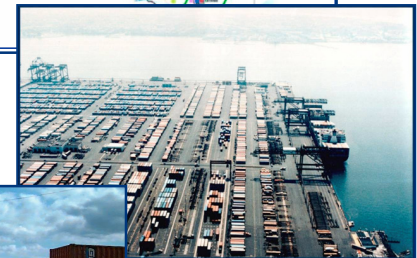


The Logistic Networks

Every year millions of goods and containers move, through the Worldwide Logistic Networks, almost every kinds of material.

Nodes, Services and Infrastructures in the different Regions are key elements: Marine Ports, Dry Ports, Inland terminals, Airports, Highways and Rails

Therefore, Logistics is strongly related to their interoperability and requires Model able to consider all the interactions among flows and infrastructures



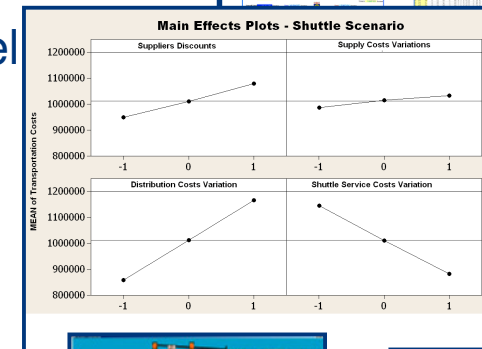
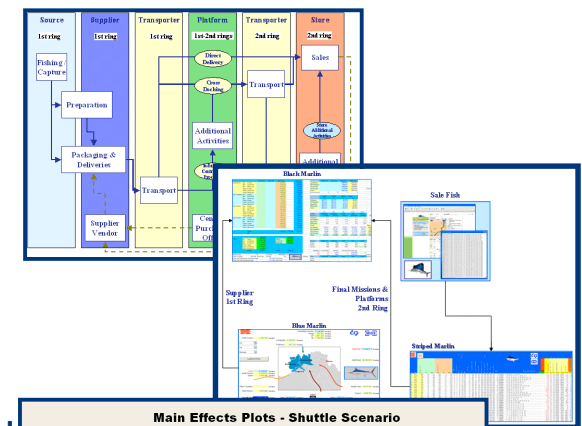


Integrated Logistics and Transportation Solutions

There is a need for a complete re-organization and optimization of the main Logistics & Transportation (L&T) policies, processes and activities.

Multiple critical aspects characterize the re-organization and optimization process: huge spare parts assortment, decentralization of the vast number of suppliers (multi-region and multi-channel problem), different constraints concerning stocking rules, availability requirement, quick response, inventory control policies, etc.

- Subdivision of L&T processes and definition of the L&T constraints
- Definition of L&T scenarios and critical factors
- Evaluation of the impact of the critical factors on L&T times and costs (input-output analytical models)





Simulation and Analysis of Logistics Networks

Integration of multiple Solutions for complex scenarios including transportation over a wide geographic area, considering Costs, Times, Constraints as well as all the major factors:

- Production Costs
- Logistics Fees
- Taxes and Duties
- Traffic Flows
- Weather
- Vehicle/Vector Saturation
- Logistics Reliability
- Logistics Processes
- Size Constraints
- Time Constraints
- Cost Constraints





M&S Resources Allocation and Logistics Planning

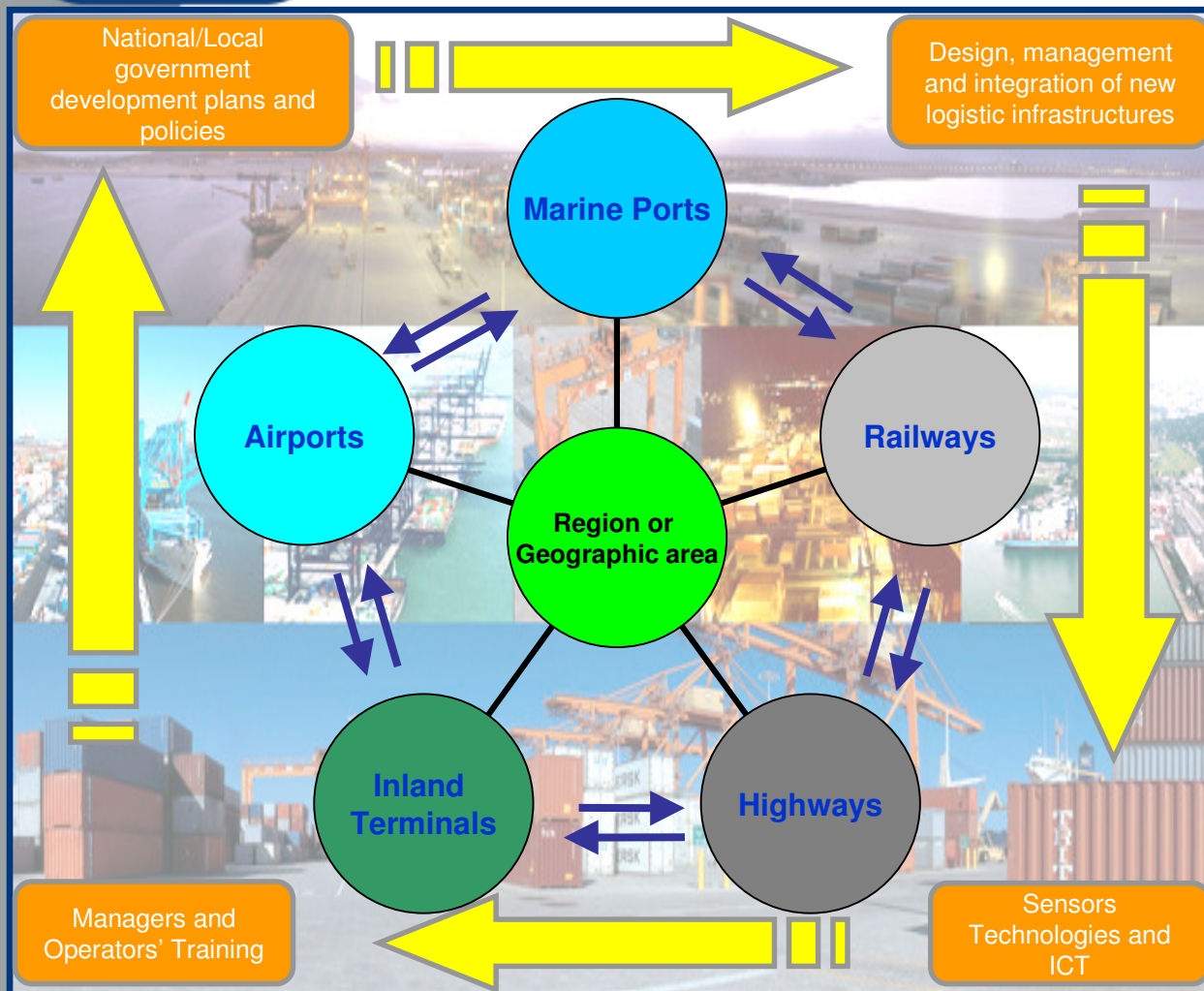
Simulation is able to supports Logistics in term of Operation Planning, Resource Management and Optimization

In addition Hybrid Simulation (intended as integration of Simulation with Intelligent Agents and Artificial Intelligence) supports scenarios evaluation and the identification of effective solutions in terms of costs, efficiency, productivity, robustness, etc.

The collage displays various simulation outputs: a 3D rendering of a cargo ship, a network diagram with nodes and edges, a data table with columns for 'split' and 'agg', a map showing ship positions, a detailed data table with various parameters, and a line graph showing performance metrics over time.



Modeling Logistic Networks



- Different Operations in different nodes
- Complex Systems integrations
- Stochastic factors and variables interact and dynamically evolve in time, space in the entire network
- Analytical approaches rarely succeed in properly identifying optimal solutions
- Complexity and Interactions among the networks require Modeling & Simulation (M&S)



M&S Applications and Solutions to Logistics

- Evaluation of actual logistics efficiency and reliability
- Costs and Time analysis
- Definition of New Policy and Procedures
- Synergies among different solutions and resources

- Enhancement of system availability through Logistics
- Position Optimization for inventory and Services
- Resource Optimization for inventory and Services
- Definition of Service Enhancement Requirements
- Supply Chain Security Enhancement
- Logistics & Transportation scenarios analysis

Logistics plans and policies

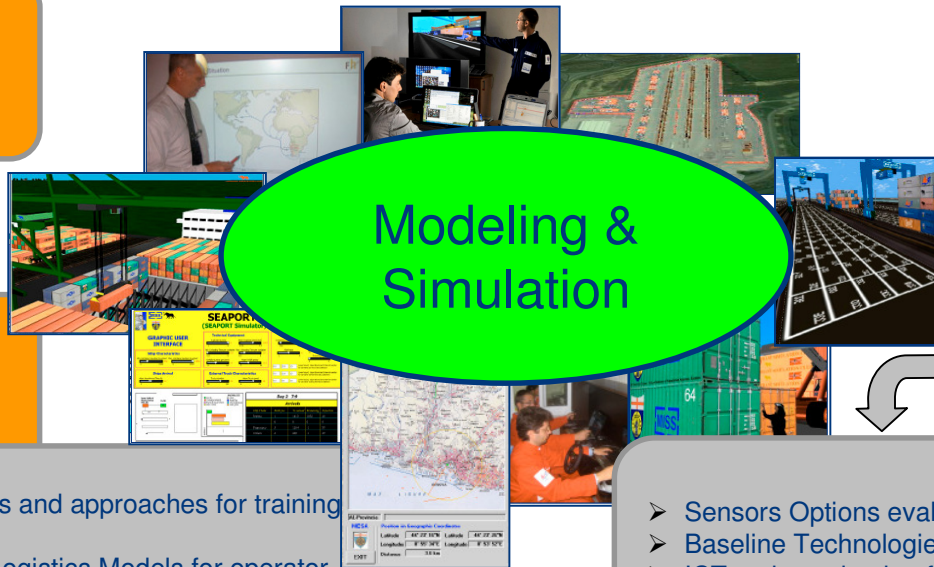
Design, management and integration of new logistic solutions

Logistics Planners and Operators' Training

Sensors Technologies and ICT

- Quantitative models and approaches for training Managers
- Interoperability of Logistics Models for operator training
- Complex logistics scenarios for Planners and Logistics Responsible

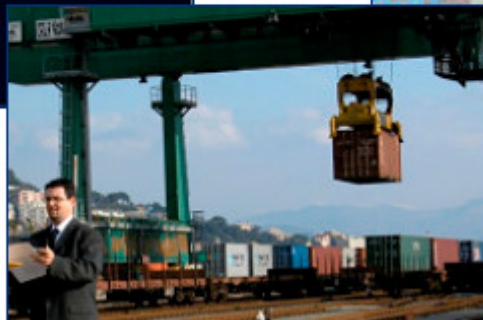
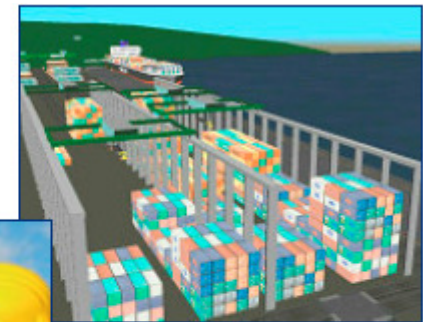
- Sensors Options evaluation
- Baseline Technologies Requirements
- ICT tools evaluation for information & data management





Logistics Operation and M&S

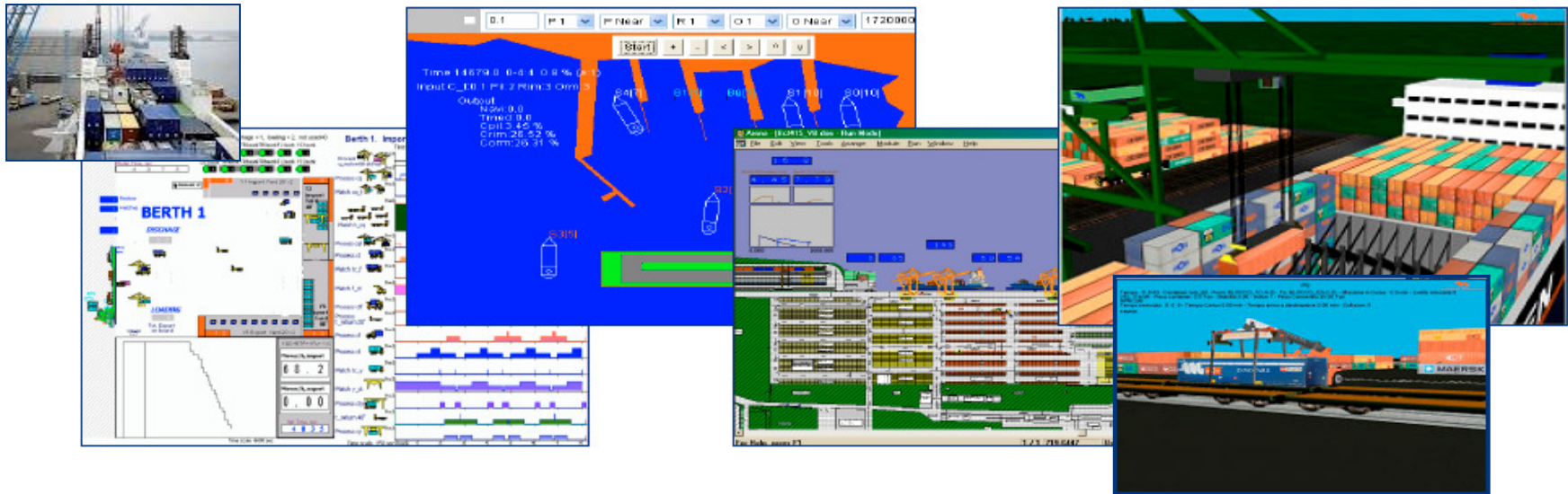
Modeling & Simulation is a powerful tool for supporting Logistics Operations. M&S provides strategic advantages for supporting the Analysis, Report phase as well as Operation and Training





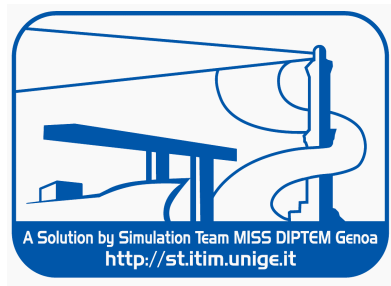
Feasibility for Logistics Planning

Today is critical to define Logistics Requirements as well as Logistics Planning for Overseas Operations based on: Cost Opportunities, Risks, Node Capabilities, Available Resources, Equipment Configurations, Timetables, Operation Planning, etc.

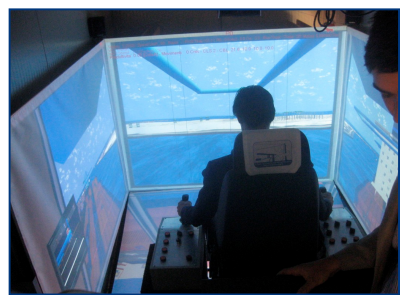
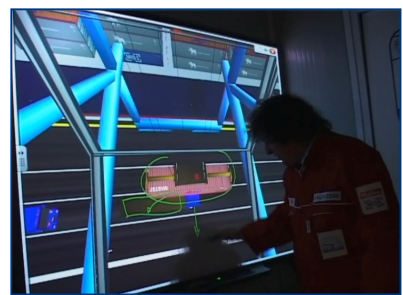


Simulation Team

ST_VP, ST_PT & ST_RS Simulators



A Solution by Simulation Team MISS DIPTM Genoa
<http://st.itim.unige.it>



A Solution by Simulation Team MISS DIPTM Genoa
www.simulationteam.com



Shelter & Facilities



ST_PT Crane Sim

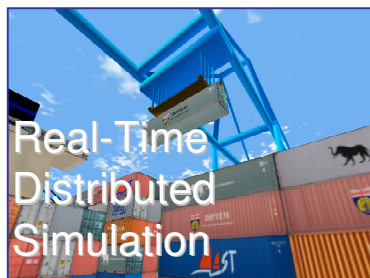
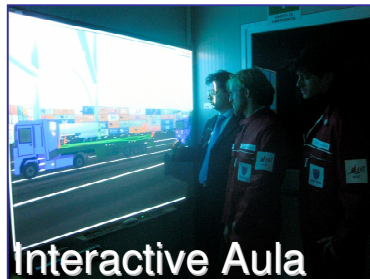
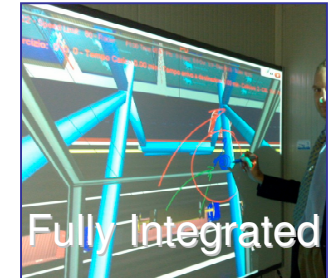


ST_RS Truck Sim

This new generation of simulator is mobile, real-time, scalable and interoperable and compliant with state of art technology and standards



Atout of our Virtual Simulation





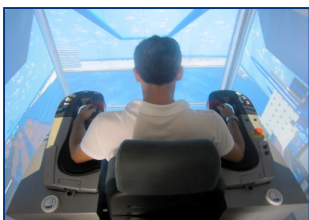
ST_VP: Virtual Port Simulation



The **ST-VP** is the ultimate Port Crane Simulator developed by Simulation Team and includes all the different crane types and New Solutions for Operator Training, Safety and Security, Procedure Definition, Equipment Design and Virtual Prototyping



ST-VP is fully containerized real-time distributed HLA Simulator reproducing Port Operations. ST-VP is integrated in a 40' High Cube Container ready to be used on site immediately after arrival.



ST-VP Simulator allows to operate all the different Port Cranes in a Virtual World by an immersive Cave (270 ° Horizontal and 150° Vertical), reproducing Sounds, Vibrations, Motion in all weather conditions

ST-VP includes a Full-Scope Simulation for Training Operations & Procedures, an Integrated Class Room, the Instructor Debriefing Room, and secondary Interoperable Simulators of all the Port Cranes and a Biomedical Module for Safety, Ergonomic and Posture Enhancement.

ST-VP World is customizable for each Port, Crane & Procedure and Equipment.

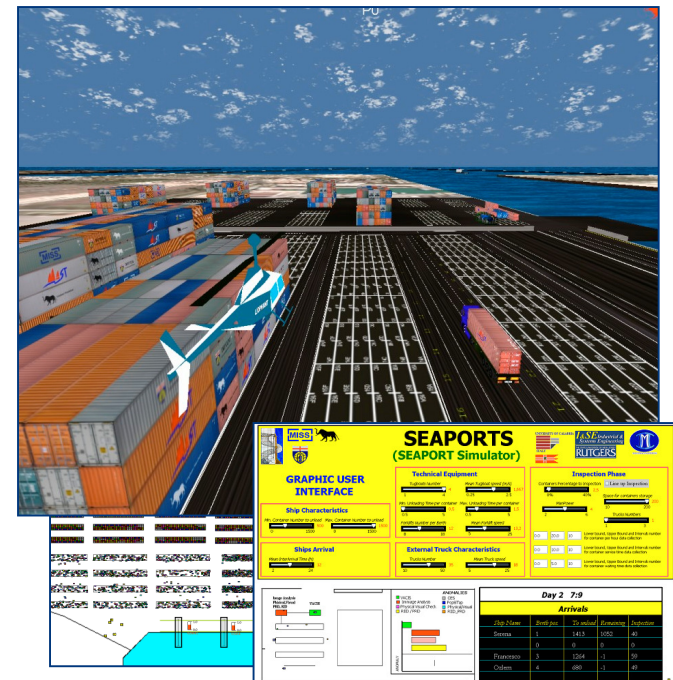




Virtual Security Assessment and Training in Logistics

VISAT (Virtual Security Assessment and Training) allows to Simulate Security Issues in Complex Framework such as that one related to Port Environments.

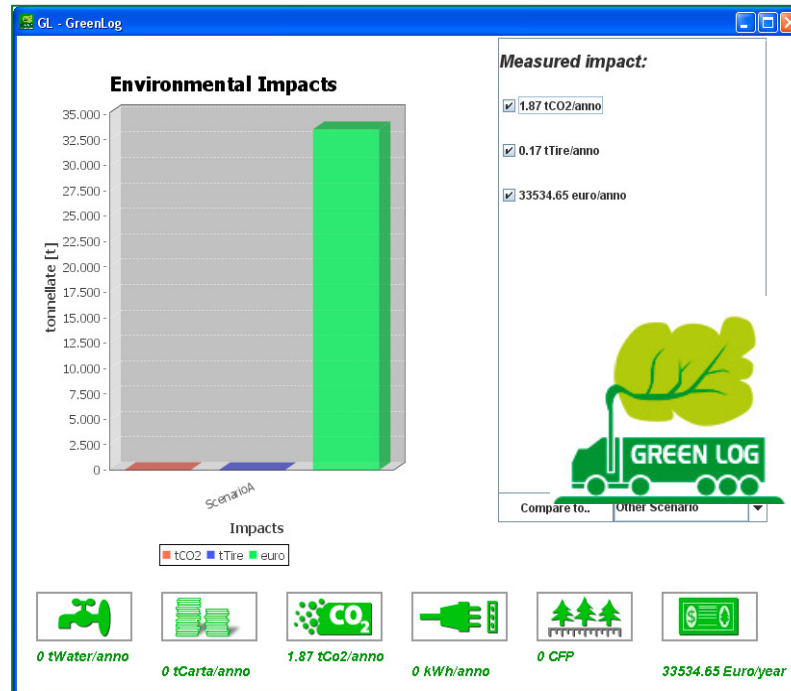
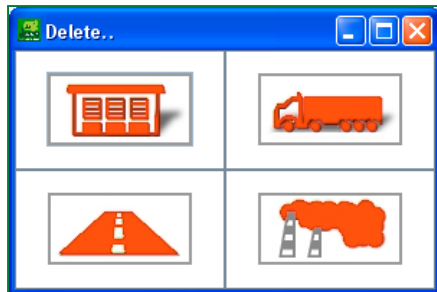
VISAT includes Constructive Sim of organizations and layouts as well as Synthetic Environment for Virtual Sim supporting Distributed Cooperative Training among different Actors (i.e. Port Authority, Coast Guard, Custom Resources, Terminal Operators, Public Urban Authorities) within different Scenarios





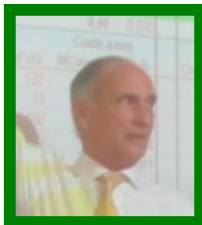
Green Logistics Project

GreenLog Simulator was adopted by a the Green Logistics Project involving “Assologistica Cultura e Formazione” and Major Production, Logistics and Retail Companies.





Industrial Guest



Rolando Toto Brocchi
Director for Logistics and IT |
CRAI Secom spa





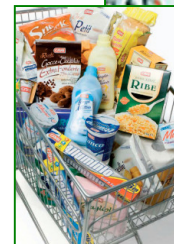
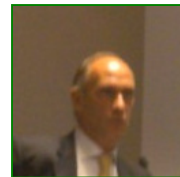
Ronaldo Toto Brocchi

• **Experience**

- Military Service in Engineering and Telecommunication
- Scientific Degree in High School
- Mechanical Engineering Degree from Turin Polytechnic
- Speaking French, English and Italian
- Current Position: Executive Director

• **Working Experiences:**

- CRAI s.c., IT and Logistics Director
- LONGONI SPORT, CEO and General Director
- STANDA, Logistics Director for Warehouse Division
- STANDA, Responsible for Supply of the Whole Corporation
- STANDA, Purchasing Division Director
- STANDA, Associate Vice President for Purchasing and Logistics
- STANDA, Organization Director
- ITALCEMENTI, Organization Manager in Engineering Department
- STIGLER OTIS, Sale Manager for North West Italy
- STIGLER OTIS, Responsible of Site Construction and Commissioning
- ANSALDO Power Division, Office Responsible for Production Planning
- ANSALDO Power Division, Assistant of Production Director

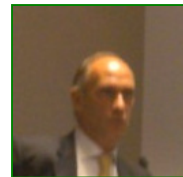




CRAI

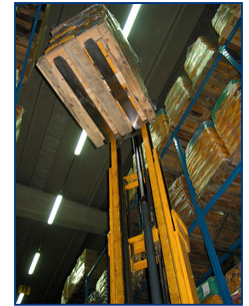


- Sales for 4.4 billions Euro in 2011
- Trend for Sales in 2011 about +4%
- 10'000 Employers
- Leading Retailer & Supermarket Chain
- 17 Poles and 2900 Stores covering 1000 Towns and 19 Regions in Italy
- Over 100 Small Stores in Switzerland and Malta
- Market Places in Chef Express
- Introduction of Eco Points
- 700 Special Stores (Beauty Star, CAD, etc.)
- 2362 Items in Supermarkets
- 1707 Items in Superette





Aziende Logistiche in un Mondo a Due Velocità



La Logistica (CEDI, Trasporti etc.) a livello nazionale e' quasi integralmente terzializzata a Aziende di Servizi, spesso di tipo cooperativo per garantire la flessibilita' del lavoro.

Il settore ha una marginalita' limitata, ma rappresenta una strategicita' per il sistema paese supportando produzione, servizi etc

L'immagine offerta del Mondo prima e dopo la Grande Crisi del 2008 sembra mostrare effettivamente due Velocita': i Servizi Logistici Nazionali sono stati pesantemente penalizzati e colpiti

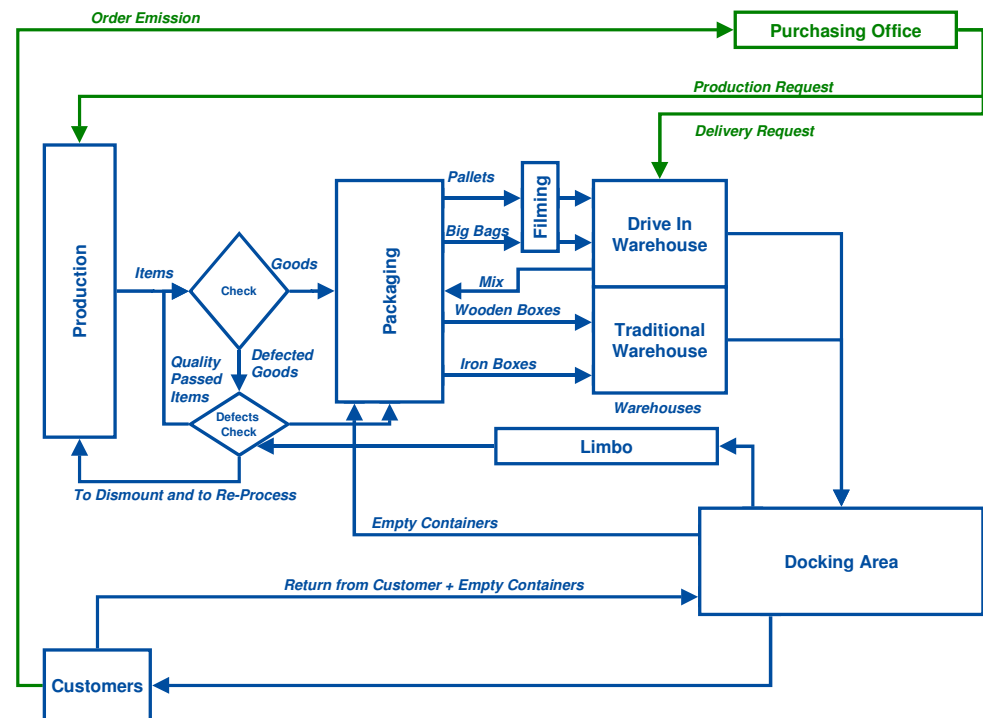
Nonostante questo fenomeno, e il fatto il nostro Paese sta vivendo una forte crisi economica, vi sono ancora opportunita' di Profitto dovuto al continuo aumento di terzializzazione da parte dei Clienti e ai margini di miglioramento dei Servizi Logistici





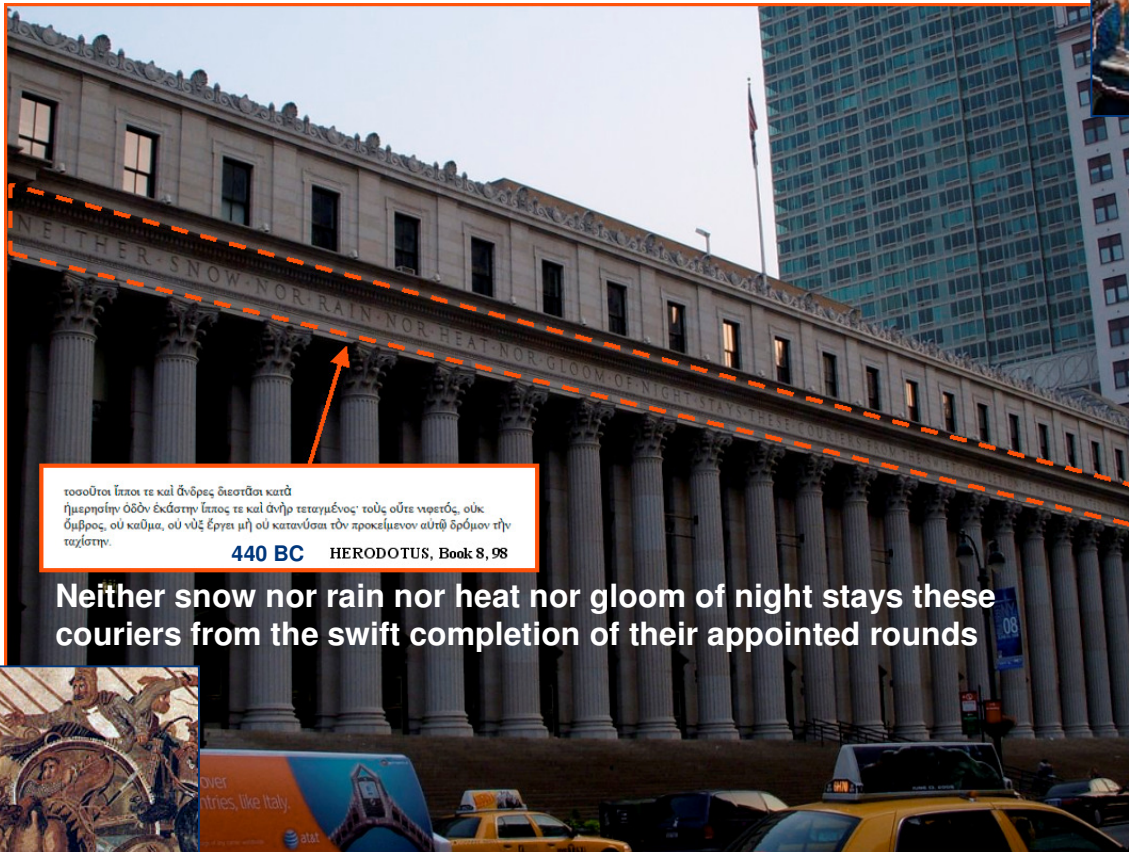
I Processi Logistici del Magazzino

Scarico
Accettazione
....
Gestione Resi
Preparazione
Carico





Gloom from 440 BC



τοσοῦτοι ἵπποι τε καὶ ἄνδρες διεστίθαι κατὰ ἡμερησίην ὁδὸν ἐκείστην ἵππος τε καὶ ἄνθρωπος τεταγμένους· τοὺς οὐτε νηθετός, οὐκ ὄμβρος, οὐ καύμα, οὐ νύξ ἔργει μὴ οὐ κατανόσαι τὸν προκειμένον αὐτῷ δρόμον τῆν ταχίστην.
440 BC HERODOTUS, Book 8, 98

Neither snow nor rain nor heat nor gloom of night stays these couriers from the swift completion of their appointed rounds



Logistics sometime seems trivial to casual observers, viceversa Logistics is often Very Challenging and requires methodology, techniques and problem solving skills.
A very good example is emerging from past Centuries, for instance during Persian Wars, it was necessary and possible to keep connected 24/7 Greece with Persia over 4380 km with just Couriers and Horses (440 BC)
This inspired the United States Post Office in engraving Herodotus quotes over NYC Central Post Office as unofficial motto for the Postmen/





GLOOM

Game On Logistics Organization and Management



GLOOM is a Role Play Game focused on Logistics that is combining Student Team Working and Top Expert Interactions; the GLOOM aim is to introduce new generation University Students inside the complex reality of Business Problems.

In GLOOM student classroom is divided in Color Team (Red, Green, Blue, Yellow); several problems are proposed in generic form to students; in each case the teams are invited to pose questions to the Industrial Expert on the scenario to collect data and acquire knowledge.



Each team present a single question in public and get its reply passing the opportunity to the next team, the loop proceed until the problem is correctly solved or time exhausted; the first team able to provide the correct answer to the problem win the set





GLOOM & Key Performance Indexes

	Seochi	Freschi	Ortofrutta	Carne	Surgelati	TOTALE
Struttura	[Detailed simulation data for Struttura]					
Addetti	[Detailed simulation data for Addetti]					
Consegne	[Detailed simulation data for Consegne]					
Mezzi di trasporto: tipo (refrigerato o no), portata, proprietà Consegne: indicare eventuali servizi combinati						



Criteria for Evaluating Nodes within a Logistics Networks



SCHEDA RACCOLTA DATI

	Secchi	Freschi	Ortolo	Carne	Surgela	TOTALE	Note
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30



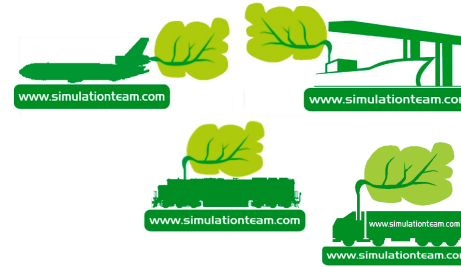
Time to Summarize... and for Questions



Simulation Team

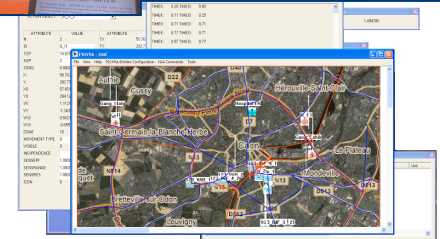
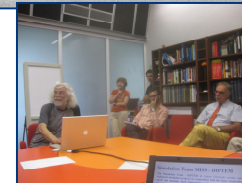


References



DIPTTEM

DIPTTEM Genoa University
via Opera Pia 15
16145 Genova, Italy
www.itim.unige.it
Agostino G. BRUZZONE
agostino@itim.unige.it



DIPTTEM
Università di Genova