

Research Group **ING-IND/17** University of Calabria



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IES

Gruppo Impianti Industriali
<http://ies.unical.it>



MSC-LES

Modeling & Simulation Center – Laboratory of Enterprise Solutions
<http://www.msc-les.org>





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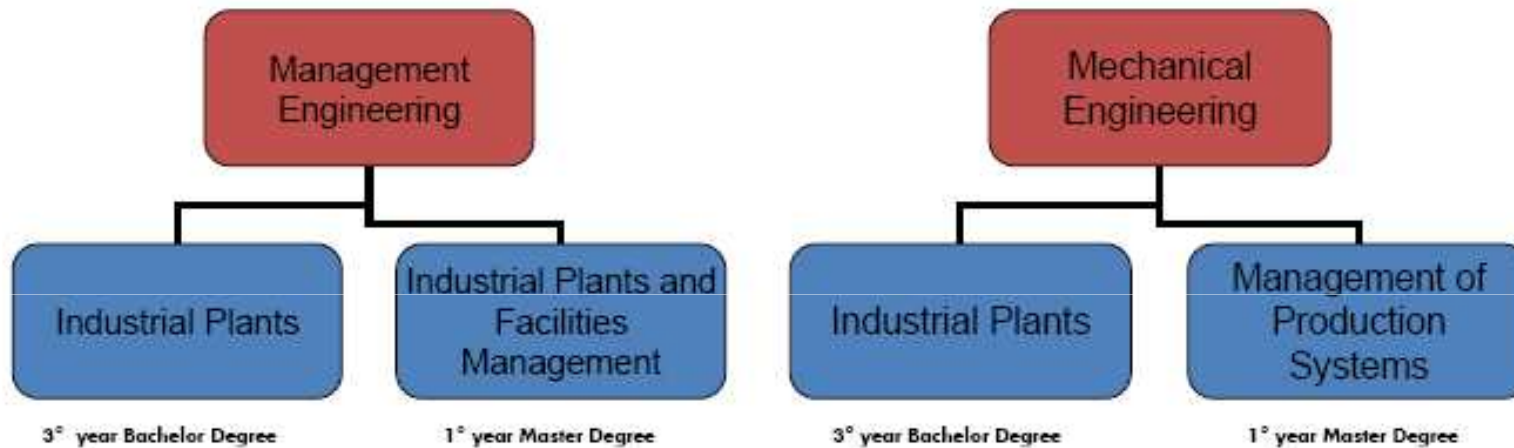


XVI Summer School "Francesco Turco" Impianti Industriali Meccanici
Abano Terme (Padova, Italy) - 14-16 September 2011



Teaching Activities

▪ Courses & Training



▪ Master



The Master is open to 30 participants, selected among graduates and undergraduates in all disciplines. The Master is open also to the participation of professionals, entrepreneurs and corporate employees that aim at specializing themselves in Integrated Management Systems.



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Research Areas

Design of industrial plants and production systems

- Cost accounting
- Business Plans and investment analysis
- Production systems design
- Plant lay-out analysis and design
- Ergonomic effective design of industrial workstations

Analysis and design of industrial plants facilities

- Plant facilities design and integration
- Plant facilities parameters modeling and optimization
- Plant facilities reliability and availability analysis
- Plant facilities maintenance
- Global service maintenance
- Plant facilities safety and security

Workplace Ergonomic design and security within Industrial Plants

- Work measurement
- Effective Ergonomic design of industrial workstations
- Risk assessment and security within industrial plants

Analysis and design of processes and production technologies:

- Assessment, analysis and rationalization of production processes
- Process Modeling and optimization
- Process innovation

Logistics & Supply Chain Management

- Supply Chain management based on Modeling & Simulation
- Supply chain security
- Demand forecasting
- Single stage and multi-echelon inventory systems
- Design and management of distribution networks
- Transportation strategies optimization
- Reverse logistics

Quality, Environment and Corporate Security:

- Total Quality Management
- Quality control services Organization
- Statistical methods for quality control
- Analysis of process capability
- Methods for improving quality
- The Six Sigma
- Regulatory frameworks for Security
- Risk assessment and mapping
- Security plans
- Internal Audits management
- Environmental management system
- Initial environmental review, technical and operational methods
- Improvement of the environmental performances

Safety and Traceability in the Food Industry

- Analysis and design of food supply chain
- Food security systems
- Food traceability systems

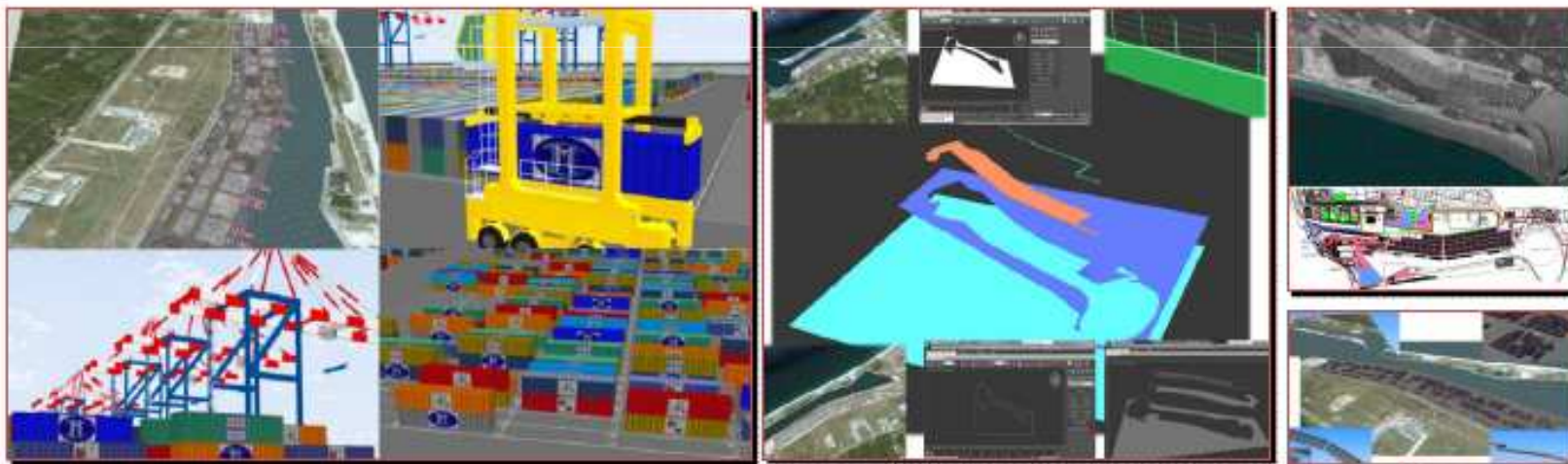




Logistics and Supply Chain Area

TRAINPORTS, TRAINing in marine PORT by using Simulation

- ❖ Practicing the theoretical concepts that have been taught and shows the consequences of the actions in a very immediate and visual manner
- ❖ Providing the instructor with a controlled environment where a large amount of data can be recorded and analyzed to evaluate the trainee's evolution
- ❖ Avoiding the danger of an inexperienced user manipulating the real machine in the working environment
- ❖ Reducing the cost associated to training
- ❖ Providing the trainee with the possibility of working in any desired conditions (i.e. arbitrary weather conditions)





Logistics and Supply Chain Area

SEAPORTS, SEAPORT Simulator

The project, developed in cooperation with University of Genoa (Italy) and Rutgers University (The State University of New Jersey, USA), proposes a simulator for analyzing and designing security procedures in a container terminal

- Review, test and certification of ports security procedures
- Security gaps identification
- Design and re-engineering of security procedures and infrastructures
- Evaluation of effects of security advances in marine ports on the global supply chain





Logistics and Supply Chain Area

SOMMA, Supply chain Orders Management Modeling & Analysis

Somma proposes an advanced modeling approach and a simulation model for supporting supply chain management. A flexible, time-efficient and parametric supply chain simulator has been obtained starting from a discrete event simulation package. Such simulator provides a decision making tool for supply chain management. The approach proposed, for investigating different supply chain scenarios, is based on analysis of variance of multiple performance measures under the effects of a user-defined set of input parameters.

The screenshot displays the SOMMA simulation environment. On the left, a flowchart shows a supply chain with three parallel paths, each starting from a 'Supply Chain Customer' and ending at a 'Warehouse'. The central window shows a 'Model Element Store' with various components like 'Inventory Manager', 'Plant', and 'Distribution Center'. To the right, there are two dialog boxes: 'Dialog' for running the simulation and 'StoresDialog' for configuring store parameters. Below these, a table provides data for two distribution centers.

Distribution Center ID	Lead Time Da	Inventory Man	Forecasts Methods	Standard dev1	Standard de	N (number of	Review Period	Inventory Costs
1	1	JRM	1	2.00	0.50	20	2	1
2	1	JRM	1	2.00	0.50	20	2	2

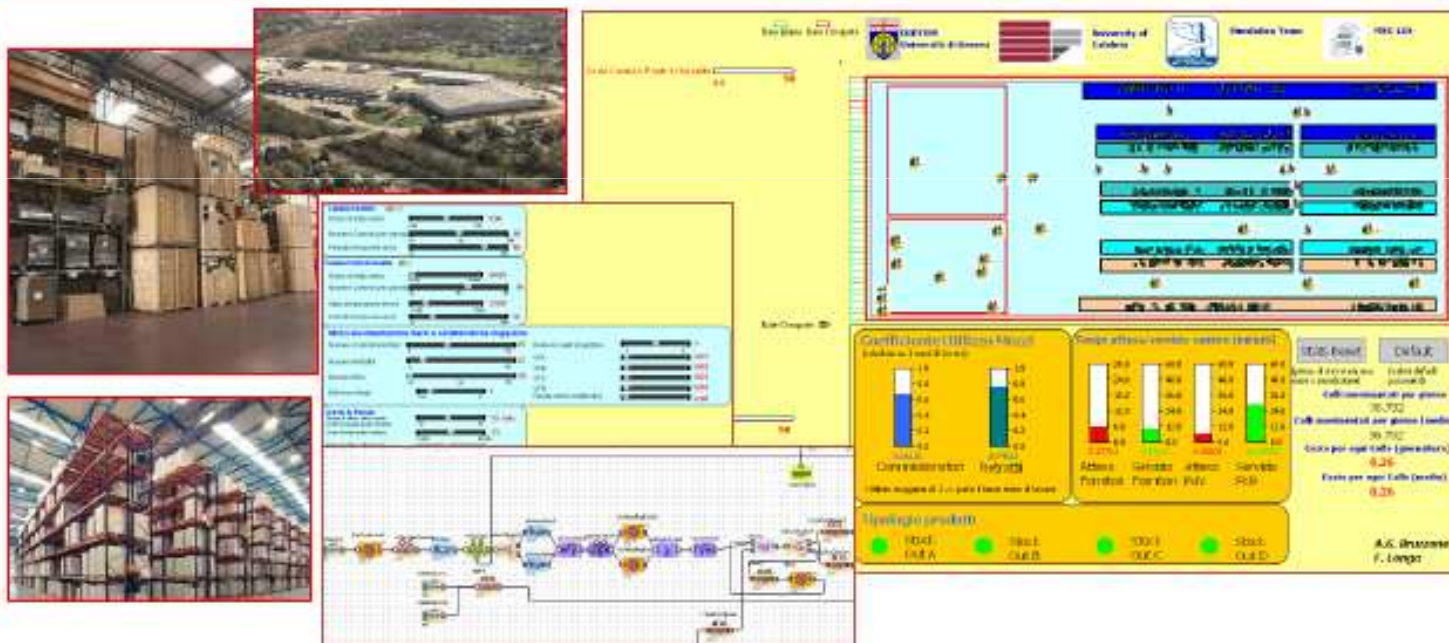




Logistics and Supply Chain Area

WILMA, Warehouse and Internal Logistics Management

The project, developed in cooperation with University of Genoa (Italy) proposes a Java-based simulator for analyzing and designing distribution centers.



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Manufacturing and Ergonomics Area

WORKS, WORKstations Simulators

The simulators allow the user to design and optimize manufacturing workstations in terms of time and ergonomic issues by simultaneously using Modeling & Simulation tools, time measurement techniques and ergonomic standards.

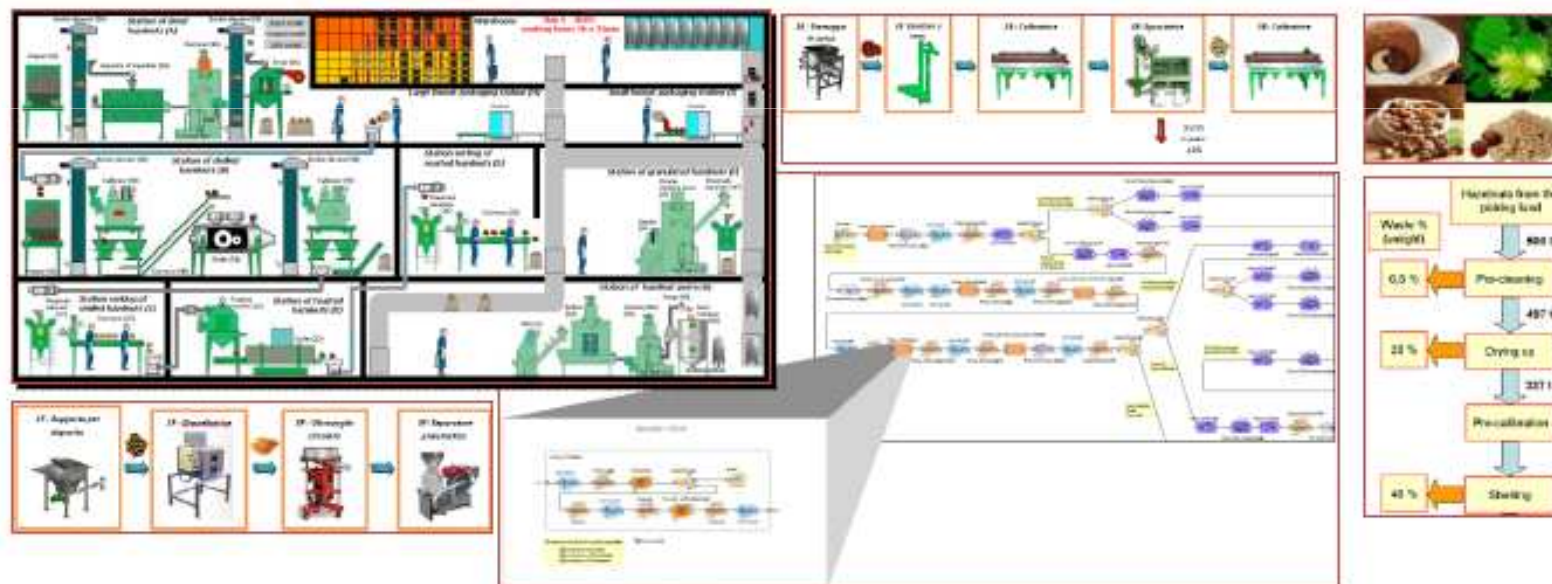




Manufacturing Area

HAZIMUT, HAZelnut Industrial plant design based on advanced Models UTILization

Starting from the market analysis and through the detailed study of all the processes related to the hazelnut production, the industrial plant location and layout have been designed. All the machineries, equipments and tools related to the production processes have been identified and economic as well as financial analysis have been carried out also using advanced models based on simulation.





Quality and Manufacturing Area

FIDOSS, Food Industry quality improved by the Development Of Six Sigma projects

The project proposes the implementation of the Six Sigma methodology in the food sector. Starting from the analysis of the major processes that occur in the food industry, the critical variables that impact on food quality have been identified. Then the qualitative aspects of foods and the implementation phases of Six Sigma in the food industry have been defined.



IMPROFOOD, Improving Final PROduct safety and traceability in the FOOD industry

Several projects have been developed in order to analyze the Food Supply Chain and to improve food safety and traceability. International standards and regulations have been analyzed and compared. Different technologies have been studied and compared in order to find the better solution for food traceability. Analytical procedures have been proposed in order to satisfy safety standards and to trace all the information needed for food traceability.





Safety and Manufacturing Area

RAMSIS, Reliability Analysis based on Modeling Safety assessment in Industrial Systems

The project proposes the implementation and valuation of human reliability within industrial plants. Particular attention has been paid to the CREAM method. Moreover, a program has been implemented in VBA in order to help the user to better analyze and evaluate human reliability.



SIDE, Safety normative and standards Implementation within an industrial plant Devoted to produce Elevators

The project proposes the implementation of the safety normative and standards within an industrial plant devoted to design, manufacture and install lifting equipment (lift systems). Particular attention has been paid to the maintenance processes.



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Top Ten Publications (2008-2010)

2010	BRUZZONE A.G, LONGO F. (2010). An advanced System for supporting the decision process within large scale retail stores. SIMULATION, Vol 86, n.12, pp. 742-762 ISSN: 0037-5497, doi: 10.1177/0037549709348801
2010	CASTILLA I, LONGO F. (2010). Modelling and Simulation Methodologies, Techniques and Applications: a State of the Art Overview. INTERNATIONAL JOURNAL OF SIMULATION & PROCESS MODELLING, vol. 6(1); p. 1-6, ISSN: 1740-2123
2010	CIMINO A, LONGO F., MIRABELLI G (2010). A General Simulation Framework for Supply Chain Modeling: State of the Art and Case Study. INTERNATIONAL JOURNAL OF COMPUTER SCIENCE ISSUES, vol. 7(2); p. 1-9, ISSN: 1694-0784
2010	LONGO F. (2010). Design And Integration Of The Containers Inspection Activities In The Container Terminal Operations. INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS, vol. 125(2); p. 272-283, ISSN: 0925-5273, doi: 10.1016/j.ijpe.2010.01.026
2009	CIMINO A, LONGO F., MIRABELLI G (2009). A Multi-Measures Based Methodology for the Ergonomic Effective Design of Manufacturing System Workstations. INTERNATIONAL JOURNAL OF INDUSTRIAL ERGONOMICS, vol. 39; p. 447-455, ISSN: 0169-8141 0169-8141 , doi: 10.1016/j.ergon.2008.12.004
2009	CURCIO D, LONGO F. (2009). Inventory and Internal Logistics Management as Critical Factors Affecting the Supply Chain Performances. INTERNATIONAL JOURNAL OF SIMULATION & PROCESS MODELLING, vol. 5(4); p. 278-288, ISSN: 1740-2123
2009	LONGO F., G. MIRABELLI (2009). Effective Design of an Assembly Line using Modeling & Simulation. JOURNAL OF SIMULATION, vol. 3; p. 50-60, ISSN: 1747-7778, doi: 10.1057/JOS.2008.18
2008	DE SENSI G, LONGO F., MIRABELLI G (2008). Inventory policies analysis under demand patterns and lead times constraints in a real supply chain. INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH, vol. 46(24); p. 6997-7016, ISSN: 0020-7543, doi: 10.1080/00207540701528776
2008	LONGO F., MIRABELLI G (2008). An Advanced Supply Chain Management Tool Based on Modeling & Simulation. COMPUTERS & INDUSTRIAL ENGINEERING, vol. 54/3; p. 570-588, ISSN: 0360-8352, doi: 10.1016/j.cie.2007.09.008





COLLABORATIONS















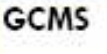


<u>Marine Ports Security</u>		<u>Supply Chain Security and Management</u>		<u>Industrial Engineering</u>	
Research centre or company name	Country	Research centre or company name	Country	Research centre or company name	Country
Laboratory for Port Security (LPS) at Rutgers University	USA	NASA-KSC	USA	Rutgers University	USA
Port Authority of Barcelona	Spain	McLeod Modeling and Simulation Network	USA	Autonomous University of Barcelona	Spain
Port Authority of Gioia Tauro	Italy	University of Ottawa	Canada	University of Perugia	Italy
Port Authority of Istanbul	Turkey	Riga Technical University	Latvia	MAST Srl	Italy
ATOS Origin SAE, Transport & Logistic UNIT	Spain	Latvian Simulation Society	Latvia	Liophant Simulation	Italy
Hamburg Port Consulting	Germany	University of Genoa	Italy	Alfagomma Spa	Italy
McLeod Institute of Simulation Science	USA	University of Rome La Sapienza	Italy		
Vitrociset Spa	Italy				
Global Teknik	Turkey				
RDLog	Italy				



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Organization of International Conferences/Events

	The 8 th International Mediterranean and Latin American Modeling Multiconference	www.mso-les.org/conf/i3m2011		The 8 th International Mediterranean and Latin American Modeling Multiconference	www.mso-les.org/conf/i3m2011
	The 23 rd European Modeling and Simulation Symposium	www.mso-les.org/conf/emes2011		The 23 rd European Modeling and Simulation Symposium	www.mso-les.org/conf/emes2011
	The 10 th International Conference on Modeling & Applied Simulation	www.mso-les.org/conf/emss2011		The 10 th International Conference on Modeling & Applied Simulation	www.mso-les.org/conf/emss2011
	The 14 th International Conference on Harbor, Maritime & Multimodal Logistics Modeling and Simulation	www.mso-les.org/conf/hms2011		The 14 th International Conference on Harbor, Maritime & Multimodal Logistics Modeling and Simulation	www.mso-les.org/conf/hms2011
	The International Defense and Homeland Security Workshop	www.mso-les.org/conf/dhss2011		The International Defense and Homeland Security Workshop	www.mso-les.org/conf/dhss2011
	The 5 th International Conference on Integrated Modeling and Analysis in Applied Control and Automation	www.mso-les.org/conf/imaaca2011		The 5 th International Conference on Integrated Modeling and Analysis in Applied Control and Automation	www.mso-les.org/conf/imaaca2011
	The Summer Simulation Multiconference 2011	www.mso-les.org/conf/summerstm2011/scs2011		The Summer Simulation Multiconference 2011	www.mso-les.org/conf/summerstm2012/scs2012
	Grand Challenges in Modeling & Simulation	www.mso-les.org/conf/summerstm2011/gcms2011		Grand Challenges in Modeling & Simulation	www.mso-les.org/conf/summerstm2011/gcms2012
	Emerging Applications in Industry and Academic Symposium 2012	www.mso-les.org/conf/springstm2012/eate2012			



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