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# STRATEGOS

Engineering Technology for Strategy & Security in Industry, Business, Service of Society, Government & Defense







## STRATEGOS...

...is about the Art to Know better what is Happening or is Likely to Happen.







### **STRATEGOS: MASTER SCIENCE IN ENGINEERING**

• **STRATEGOS** is the new International MSc (Master Science) in Strategic Engineering (Laurea Magistrale in Italia, 2 anni)

• **STRATEGOS** promotes Quantitative Modeling to Support Decisions by developing a new generation of Engineers able to deal with Strategic Thinking and to interact with Decision Makers

• **STRATEGOS** prepares Engineers with strong foundation in Modeling, Simulation, Big Data Analysis, Al/IA as well as Enabling Technologies for Strategic Decision Making

• STRATEGOS is Trans-Disciplinary over Engineering, Economics and International Affairs to enable candidates to address effectively Security, Scenario & Risk Analysis



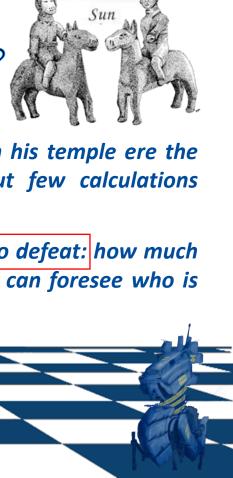
### **STRATEGOS & SMART COMPUTATION**

夫未戰而廟算勝者,得算多也; 未戰而廟算不勝者,得算少也; 多算勝,少算不勝,而況於無算乎?

吾以此觀之, 勝負見矣。

Now the general who wins a battle makes many calculations in his temple ere the battle is fought. The general who loses a battle makes but few calculations beforehand.

Thus do many calculations lead to victory, and few calculations to defeat: how much more no calculation at all! It is by attention to this point that I can foresee who is likely to win or lose.







#### STRATEGY: !?!

Classic Definitions: Strategy relies on effective plans able to achieve success in challenging situations such as business, industry, politics, war, etc.

Strategy, Greek word, combines stratos (army) and ago (leading): Leading Resources

"La Stratégie est l'art de bien diriger"

Gen. Jomini, Prècis de l'Art de la Guerre, 1838

"We need a philosophy of **Strategy** that contains the seeds of its constant rejuvenation, a way to chart strategy in an unstable environment"

Von Clausewitz, Vom Kriege, 1832

"Strategy is a system of expedients"

"No plan of operations extends with any certainty beyond the first contact with the main hostile force"

Von Moltke, Militarische Werke, 1871

"Today, to be a great company, think about what Social Problem you could solve"





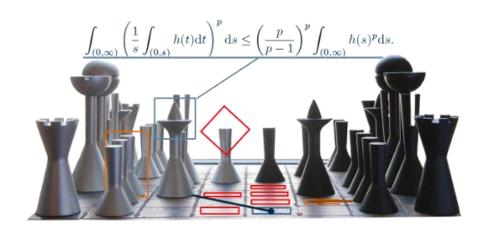
#### STRATEGIC ENGINEERING

- STRATEGIC ENGINEERING is a pretty new approach, emerging in Excellence Centers around the World, where New Technologies and Methods face Challenges & Uncertainty in Complex Systems
- **STRATEGIC ENGINEERING** is the process of designing and analyzing New Solutions in order to achieve Strategic Results against *risks*, *uncertainty*, *competitors*, *threats and* within *critical environments*
- STRATEGIC ENGINEERING is crucial to develop Modern Solutions for Defense, Homeland Security, Government as well as for Industries, Companies, International Agencies & Public Authorities



## STRATEGOS Engineering Technology for Strategy & Security in Industry, Business, Service of Society, Government & Defense

#### **STRATEGOS MISSION**



• STRATEGOS creates a New Generation of Engineers able to deal with Decision Making and Strategic Thinking in complex Scenarios

• **STRATEGOS** prepares Engineers to master Modeling, Simulation, Enabling Technologies such as: Machine Learning, AI & IA, ICT, IoT & IoE, Big Data, MR, Data Farming, Data Analytics, Innovative





### **STRATEGOS ENGINEER ROLES**

The **STRATEGOS** Engineers could serve in multiple roles such as:

- Scenario Identification, Definition and Analysis
- Development of Models of Complex Systems
- Strategic Planning and Analysis
- Strategic Analysis and Decision Support in Defense & Homeland Security
- Support Decision Makers by Quantitative Methods, Models and Analytical Approaches
- Support to Governmental &International Institutions, Policy Makers and Public Authorities
- Support to Industries in Strategic Decision Making, Planning and Scenario Definition
- Data Farming by Simulation to extend, integrate and fuse Big Data for Data Analytics
- Development of New Algorithms, Models and Architecture devoted to model Complex Systems
- Supporting Organization Management in objectives definition and strategic planning
- Simulation, through the implementation of self-built systems, of the evolution of events
- Strategic Modelling & Analysis for Hybrid Warfare, STRATCOM, Cyber Warfare,
- Modeling, also through capture of data & information conditioning, of the Scenario
- Development of plans to defend and restore systems and organizations









### STRATEGOS ENGINEER SKILLS

The Skills associated with **STRATEGOS** Engineers include among the others:

- Engineering and Modeling applied to Complex Systems
- Modeling and Simulation
- Data Farming and Data Analytics
- Scenario Analysis
- Artificial Intelligence, Intelligent Agents and Machine Learning
- Economic and Political Analysis of Scenario and Operational Context
- Feasibility Analysis of the Alternative Solutions
- Context Engineering for the Technical Sustainability of the Strategies
- Strategic Planning to implement Strategies and Operations
- Robotic Process Automation, Autonomous Systems and Heterogeneous Networks
- AR, VR, Graphics and Visualization, to move results into an easily accessible and understandable, interactive, immersive and interoperable framework
- Mathematics, Information Technology and Engineering for Implementation
- Security of Cyber Physical Spaces & over Multi Domain Frameworks

















### STRATEGOS ENGINEER PLACEMENT

**STRATEGOS** Master Program offers a professional engineer profile with a strong foundation in the area of modeling, analysis and strategy planning for Systems, Operations, Organizations and Products. The expected employment target include large companies, but also SMEs that could benefit from this engineering background and by their specific skills and competences. Employment in Public/Pivate Research and Management/Administration Centers is targeted as well as in Industries and Companies. Hereafter some examples are proposed:

- BoD Staff in Major Industries (Oil & Gas, Defense, Energy, Manufacturing, Resilience & Sustainability, Investments, etc.)
- Support to Directors on Operations, Multi-Project Management, Operational Level, Grand Tactics devoted to implement Strategies, etc.
- Strategies for Specific Domains: Defense, Energy, Shipping, Marine Sector, Aerospace, Communications, Finance, Process Plants, Retail
- New developments enabled by Autonomous Systems and Enabling Technologies (e.g. Security, Aerospace, Sea Robotic Systems, etc)
- Support to Defense & Homeland Security: Commander Decision Support in Operational Planning
- To design, develop and manage Security Solutions over Multi Domain and Layers for Business and Governmental Users
  - -COA Definition, Quantitative Support to Negotiation and Consensus, Strategies for Homeland Security & Defense,
- -New Programs and Simulation Based Acquisition, etc.
- Support to Agencies & Governmental Institutions (e.g. EDA, ONU, NATO): Strategies on International Affairs, Consensus, Strategies in Service to Society, Health Care & Strategies, etc.
- · Models for Companies specialized in Complex Systems and Plants, Predictive and Distributed Maintenance, Smart Services etc.
- Design, service and management companies (including Banks and Insurances) requiring scenario simulation, data processing, etc.
- Generic componies (e.g., B2C, B2B, software houses, mechanical electrical and electronic components and systems, etc.) interested in Decision May and Engineering, especially considering Product/System/Service Strategy. This should concern also SMEs



### **STRATEGOS**

#### 1st Year

**Modelling and Design of Complex Systems, Complex Systems in Industry and Defense** 

**Continuous & Discrete Modelling and Simulation** 

**Operation Research for Strategic Decisions** 

**Advanced Methods of Monitoring and Design** of Systems

Strategies for Energy

**Economics** 

Strategies for

**Telecommunications** 

**Security Studies:** 

Foreign & Defense

**Policies** Comparative Political

**Economy of** 

**Development** 

**Elements of Business Economics** 

Computational

Intelligence

**Integrative Workshops** 

**Summer Stages** (3-6 weeks) **PROGRAM** 

#### 2nd Year

**Computer Games and** Simulation

Autonomous Agents in **Games** 

Architectures and **Models for Numerical Methods** 

**Organization and Strategic Business** Management

**Integrative Workshops** 

**Training Modules** 



**Project Work** 

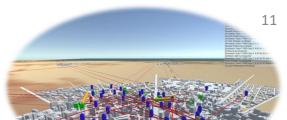
**Thesis** 















### **STRATEGOS LABS & PARTNERSHIP**

STRATEGOS MSc relies on its strong partnership with major Industries, Agencies, Institutions, DoD & MoD. Currently there are already Endorsements for cooperation with several Entities and additional Agreements are on going for Development noveo innovatina regi life ANSALDO L'AUÈ(E) E1105 **BearingPoint**<sub>®</sub> accenture THALES DIEC **DISPO** tenova ims M&SNet Horsa devLab SEASTEMA HITACHI a≰po Inspire the Next DoD Department of Defense MoD Ministry of Defence ST ENGINEERING ANTYCIP



#### **STRATEGOS & GENOA UNIVERSITY**

**STRATEGOS** is led by Genoa University, founded in 1471 AD and located

in middle of Italian Riviera, covering all disciplines and counting around 40,000 students in total. The Engineering School of the Genoa University was created n 1870 AD and is among most prestigious Internationally (in 2018 we rank 1st in Italy) and provides BE, MSc and PhD Programs to 7,500 students.

STRATEGOS promoters in Genoa University are active in International projects with major Agencies and Companies at International Level, as well as in co-operations with Prestigious Universities and Institutes all around the world.

Genoa University offers STRATEGOS Workshops and Seminars, closed

And open to external attendees and/or invited guests, jointly with NATO Excellence Centers, Research Labs and R&D Departments in leading International Companies.







- Turning into one of Leaders on new **Strategic Engineering** Concept
- Having access to best STRATEGOS <u>Students</u> for <u>Internships</u> & <u>Stages</u>
- Being part of STRATEGOS Committee for <u>Program Development</u>,
   participation to <u>Selection Process</u>, creation of new <u>RPGs</u> and <u>Experiences</u>
- Your Employers & Executives could access to STRATEGOS <u>Workshops</u> & <u>Seminars</u>
- Benefits of STRATEGOS promotions all over the world in <u>Public Affairs</u>, <u>Media</u>, <u>Table</u>
   <u>Top Exercises</u>, <u>Simulations</u>, <u>Special Events</u>, etc.
- <u>Networking</u> in STRATEGOS with other <u>Leading Companies</u>

By the way, basic Patronage is Free and requires to evaluate the Student curricula for potential Internship proposals





#### STRATEGOS IN 10 POINTS: 5...



- •STRATEGOS is the <u>first Master Science in Strategic Engineering</u> (Laurea Magistrale) <u>in Italy</u>, among <u>the first ones in the world</u>
- **STRATEGOS** lasts 2 years in total, including the <u>six-month internship</u> and the related thesis conducted entirely within an Enterprise (48 Credits)
- **STRATEGOS** has **Industrial Partners** of the caliber of Accenture, Ansaldo, Axpo, BearingPoint, Hitachi, Leonardo, Thales, Tenova, etc.
- STRATEGOS provides <u>high-profile job opportunities</u> in <u>Big Industries</u>, <u>Consulting Firms</u>, <u>Hi-Tech Startups</u> & <u>Int. Agencies</u> (e.g. NATO M&S COE)
- STRATEGOS teaches how to combine Modeling & Simulation, Al/IA & Machine Learning, Data Analytics to support Strategic Decision Making





#### STRATEGOS IN 10 POINTS: 5... PLUS 5



- **STRATEGOS** integrates new technologies with enabling factors such as **IoT**, **IoE**, **Social Media**, **HBM** to develop new Solutions
- **STRATEGOS** is really **Transdisciplinary** and, thanks to its courses within **Economics & Int.Affairs**, teaches Engineers to work with Decision Makers
- STRATEGOS is International, all in <u>English</u>, with Workshops in <u>Virtual Labs</u>, <u>Simulation</u>, <u>RPG</u>, <u>Serious Games</u>, <u>eXtended Reality</u> (VR/AR/MR)
- **STRATEGOS** accepts all types of talents from **Scientific & Engineering BS** and provides assessments on the potential in Strategic Engineering
- STRATEGOS for additional information <u>www.itim.unige.it/strategos</u> or contact us

by email info.strategos@diten.unige.it

IoT Internet of Things
IoE Internet of Everything
HBM Human Behavior Models
RPG Role Playing Game

VR Virtual Reality
AR Augmented Reality
MR Mixed Reality

## **COMPANIES, INSTITUTIONS IN STRATEGOS**

- Leading the <u>Strategic Engineering</u> within its <u>First Italian</u>
   <u>Degree Program</u>
- Evaluation of STRATEGOS Engineering Students by <u>RPG</u>,
- Internships, Exercises, Simulations, Experiences & Stages
- Active Participation in <u>Specific Experimentation & Training</u>
   <u>Modules</u> integrated in STRATEGOS and open to Company Employers
- Active Role in STRATEGOS and its <u>Excellence Network with</u>
   International Companies, Institutions & Agencies
- Promotion of STRATEGOS within <u>Public Affairs</u>, <u>Media</u>, <u>Table</u>

  <u>Top Exercises</u>, <u>Simulation</u>, <u>Workshops</u>, <u>Special Events</u>,



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#### SPECIFIC ROLES FOR STRATEGOS PARTNERS

- Members in **STRATEGOS** <u>Steering Committee</u> contribute actively in Student Profile, Tailoring Programs, Lectures and Internship Planning
- Members in the **STRATEGOS** <u>International Scientific Committee</u> contributing in defining Workshops, Seminars on Topics & Methods
- Partners contribute in creating STRATEGOS Modules for Education and Training consistent with <u>Industrial Interests and Needs</u>
- Partners in STRATEGOS by <u>Suitability Survey & Feedback</u> analyze & quantify this new Degree profile respect Modern World Expectations
- Promoters of <u>Specific Tools</u>, <u>Solutions & Approaches</u> experience the <u>STRATEGOS</u> Students to enhance their own Capabilities







### **ADVANTAGES FROM STRATEGOS PARTNERSHIPS**

- Interaction with Students and Engagement in Selection Process
- Hosting Internships & Thesis Students (2<sup>nd</sup> year, 2<sup>nd</sup> Semester, 4-6 months)
- Proposing <u>Personal Project Works</u> to STRATEGOS Students
- Proposing <u>Topics and Solutions</u> for STRATEGOS Program & Seminars
- Attending Joint Activities & <u>Table Top Exercises</u> within STRATEGOS
- Partnership in Developing STRATEGOS Workshops, Seminars, RPG
- Active Actor in STRATEGOS <u>Selections & Final Assessments</u>
- Contribution in <u>Social media</u>, <u>Web links</u>, <u>References</u>, etc.
- Student Summer Stages (1st year, June-Sept, 4 weeks)







#### OPPORTUNITIES IN STRATEGOS

- Involvement of <u>Company Experts</u> in Seminars, Workshops, Meetings, physically & virtually, with **STRATEGOS** Classes on specific topics
- Organization of <u>RPGs, Virtual Experiences & Table Top Exercises</u> of interest for the <u>Company</u> within <u>STRATEGOS</u> Classes & Simulations
- Access to <u>Computer Simulators, Intelligent Systems & Serious</u>
   <u>Games</u> developed for Industries & Agencies & adapted for STRATEGOS
- Promotion of **STRATEGOS** <u>Scholarships for Gifted Students</u> and involvement in the Related Selection and Evaluation Process
- <u>Activation of R&D Initiatives</u> on Modeling, Simulation, Decision Making, Machine Learning, Data Analytics, Strategic Engineering, etc.





### PARTNER INTERNAL GROWTH BY STRATEGOS

- <u>Rewards to Company Staff</u> as members of the <u>International Faculty</u> of **STRATEGOS** when they are involved in the teaching and experimentation activities in Classrooms, Labs and/or Experimentation
- Access of <u>Company Managers & Employees</u> to STRATEGOS Courses, Seminars & and Workshops, or even to obtain the full <u>Master Degree</u> in Strategic Engineering
- Enhancement of Personnel, Active in Branch Offices or in other Areas, by Live/Remote STRATEGOS Training
- Synergies among **STRATEGOS** and other Initiatives, already active in Companies, Agencies and/or within specific Business Sectors







### **MODELING & SIMULATION FOR COMPLEX SCENARIOS**

- Strategic Engineering includes Models of Media, Communications, Fake News and Assets to experiment, virtually, different *Decisions* and *COAs*
- The M&S of Social Networks, Cyber Space and Population, Markets is able to estimates their reactions to Situation Evolution and to our Choices
- Strategic Engineering could use Immersive, Interactive, Interoperable Environments for helping Decision Makers to understand Scenarios and to support their Decisions



M&S & Simulation

COA Course of Actions





#### EXAMPLE: JANUS IMPROVING PROCESSES & PEOPLE

- JANUS is a Serious Games that uses Avatars and Human Behavior Models to reproduce Meeting Dynamics and Digitalization Initiatives
- JANUS has been developed to train & educate people, but for finalizing assessments
- JANUS identifies criticalities
   & behaviors in Digitalization
   Projects by Machine Learning
- JANUS allows to finalize quickly Digitalization in Companies by improving People and Processes







#### **EXAMPLE OF STRATEGIC DECISION SUPPORT**

 T-REX is a Decision Support System based on MS2G devoted to reproduce Cyber & Hybrid Threats open to be federated with other

elements to evaluate Risks & Scenario Evolution

T-REX is a solution by Simulation Team, reproducing

Human Behaviors

Population & Interest Groups

Social Network & Media

Urban & extra Urban Contexts

Layers (i.e. economic, political, social, etc.)

•Multiple domains (i.e. land, air, sea, space and cyberspace).







## STRATEGOS Engineering Technology for Strategy & Security in Industry Business, Service of Society, Government & Defense

#### **STRATEGOS REFERENCES**

#### **POINTS OF CONTACT**

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