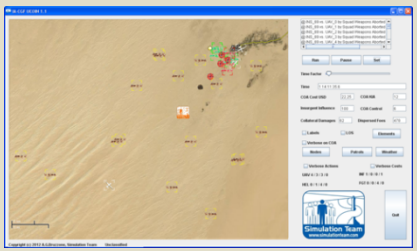

Simulation of Multi Coalition Joint Operations Involving Human Modelling (SIMCJOH) PROJECT

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NATO Modelling & Simulation Centre Of Excellence

Aim

- Highlight the impact of human factors in modern military operations
- Describe the state of art of SIMCJOH Project on human factor's simulation
- Show the existing supply/demand relationship

Human Factors in Military Operations

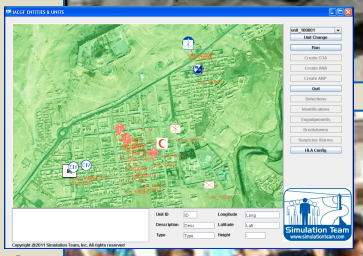
Over the last two decades, military forces have been deployed to areas where the history, culture, language, religious and tribal or family dynamics have played a key role in shaping military operations

- Fall of Berlin Wall: humanitarian & peacekeeping operations

- Sept. 11 Attack: rise of new asymmetric threats
  - need to understand the psychological, social and cultural reasons of a threat
  - emotional impact of a military operation on civilians' perceptions

Perception of Militaries in Local Population

Events, Decision, ROE, Policies and Actions strongly influence the Perception of Militaries in Local Population



This means that is necessary to develop models and simulators to support training and decision making processes

NATO Strategic Concept

- New NATO Strategic Concept:
  - need to fight not only conventional threats
  - need to fight also "extremism, terrorism, and trans-national illegal activities"
  - need to foster security through the conflict prevention and crisis management
  - need for a comprehensive political, civilian and military approach for effective crisis management

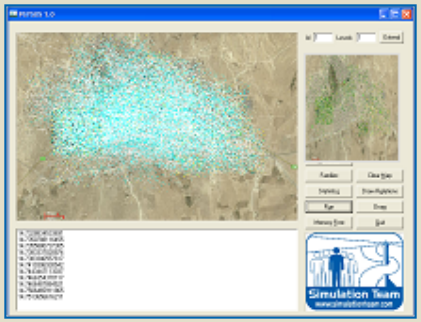
- New cycle of the NATO Defence Planning Process (NDPP)

- Capability Shortfalls based on new concepts like Comprehensive Approach, Cross-Cultural Awareness and Understand to Prevent

Supply/Demand Relationship

NATO CAPABILITY DEMAND: training and decision support on
Understand to prevent
Cross Cultural Awareness
Comprehensive Approach

M&S SUPPLY: cost-effective provider of simulation models that take into account also Human Factors



SIMCJOH Project

The SIMCJOH (Simulation of Multi Coalition Joint Operations Involving Human Modelling) programme is a new research initiative of the University of Genoa (Italy). SIMCJOH Research Programme objectives are to study and develop new simulation models, in order to support the decision makers in Joint and Multi-Coalitions scenarios, considering a strong involvement of human factors with a particular focus on issues of refugees and civilians, natural disaster relief with presence of civilians in a theater of military operations; the initiative get benefits from innovative researches in population and human behavior modeling

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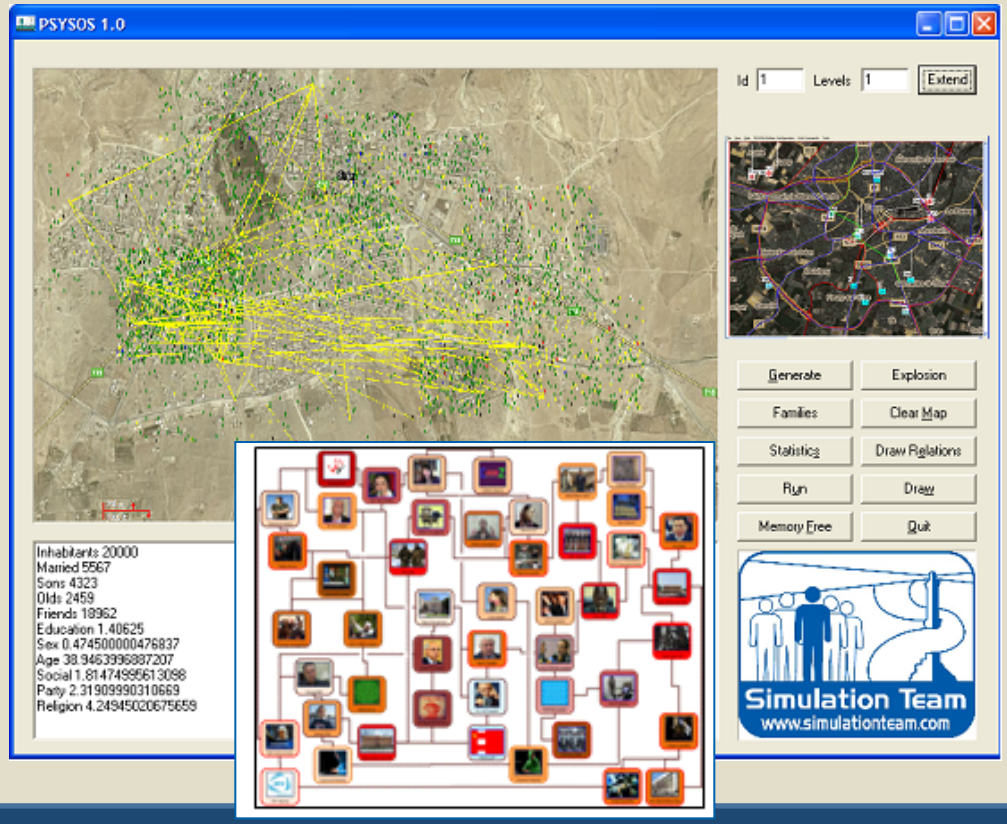
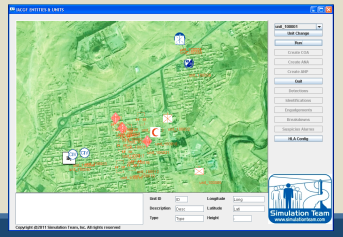
IA-CGF and SIMCJOH

The Intelligent Agents Based Simulation in SIMCJOH will allow to add a new layer to complex scenarios, which takes into account the influence of human factors and the attitude for cooperation and coordination in multi-joint coalition operations. This will provide the opportunity to quickly test different alternatives based on quantitative data.



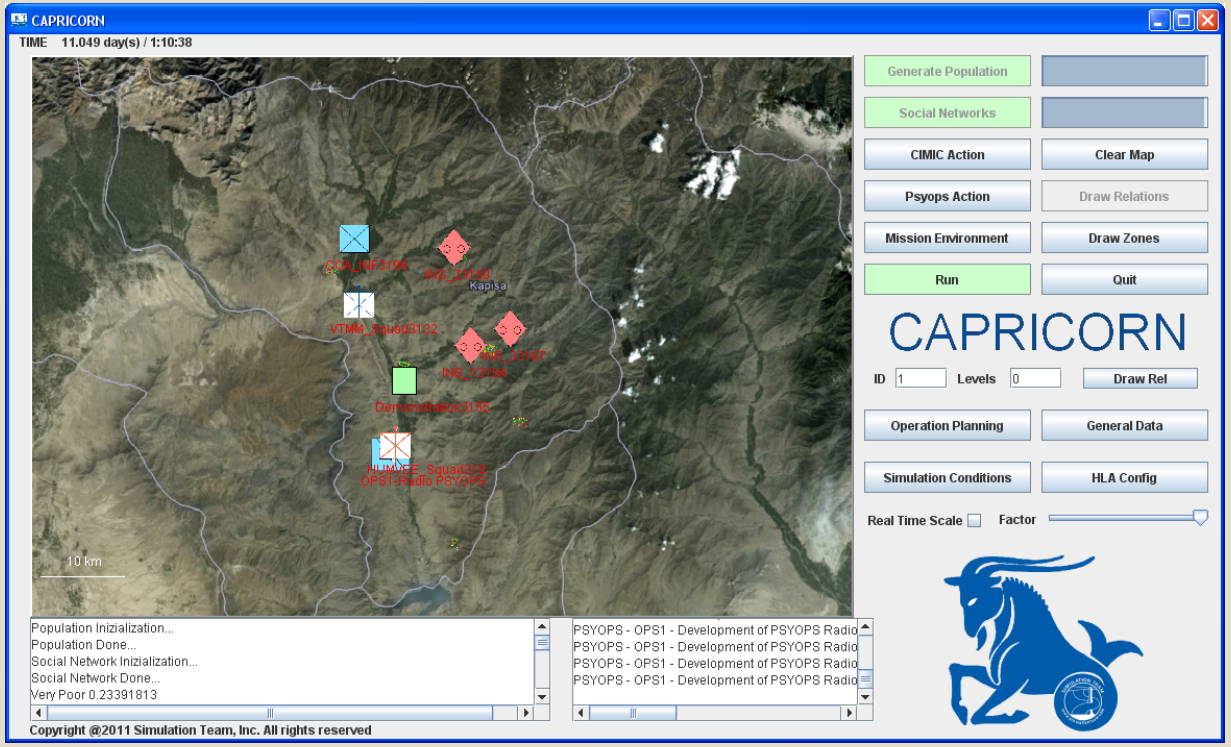
SIMCJOH Federation

Since the prototypal stage, SIMCJOH federation of simulators meets the expectation of an usable and useful tool, able to support the Defence Capability Demand and repay the investment. In fact, using this federation both the operational planners and the analysts will be able to conduct further experiments to evaluate different approaches to C2 in accordance with NATO Maturity Models (NATO NEC Maturity Models Command and Control - N2C2M2). Thanks to interoperability system based on SIMCJOH findings could reuse models and simulators developed for other operating environments and scenarios and will add functionality that will enable a considerable impact.

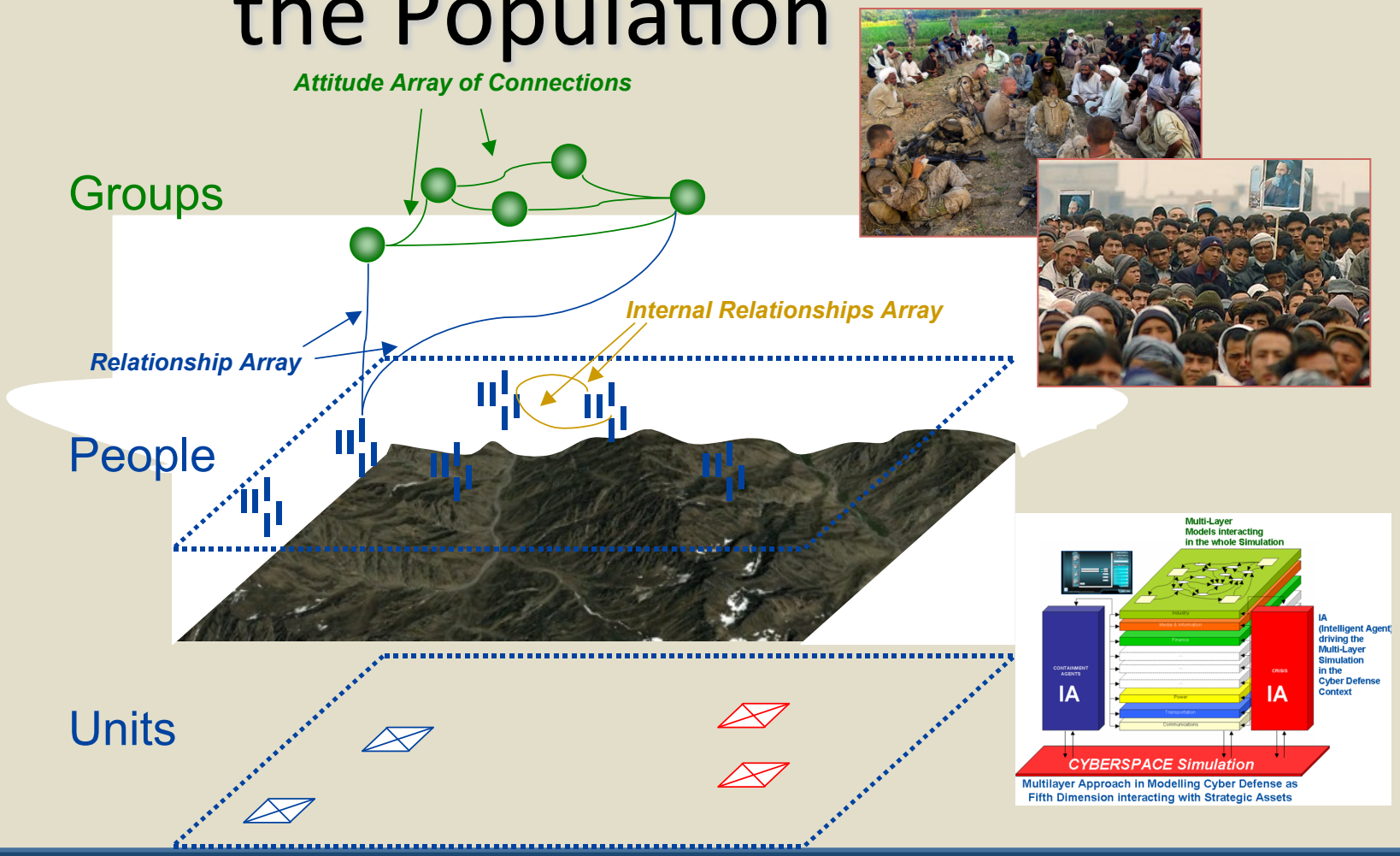


Example: Modeling Military Planning & Population

Example of using IA-CGF in Capricorn Simulation in order to support CIMIC planning and evaluate its impact on population and interest groups

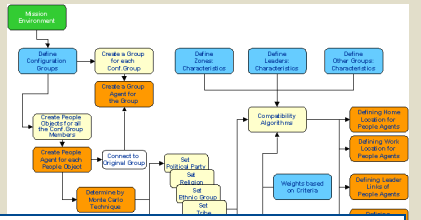


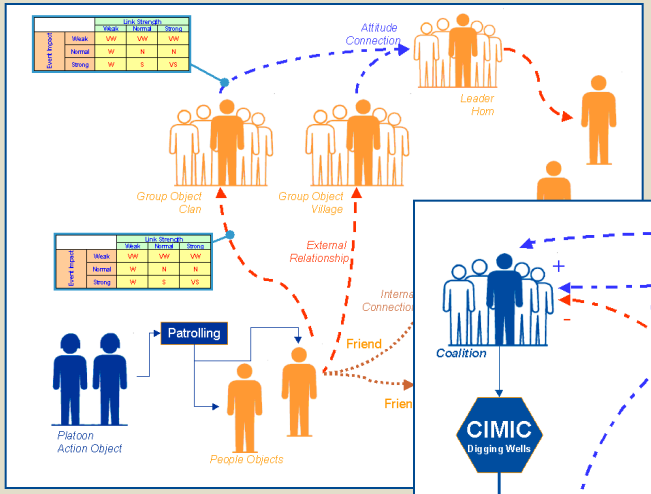
Multilevel Group Model of the Population

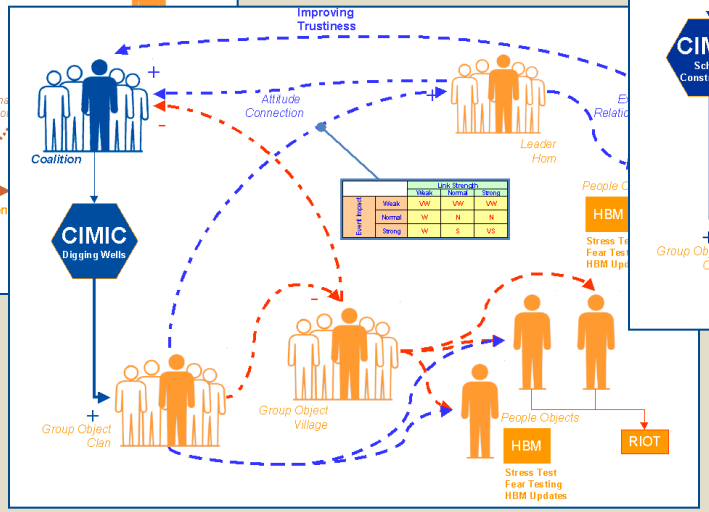


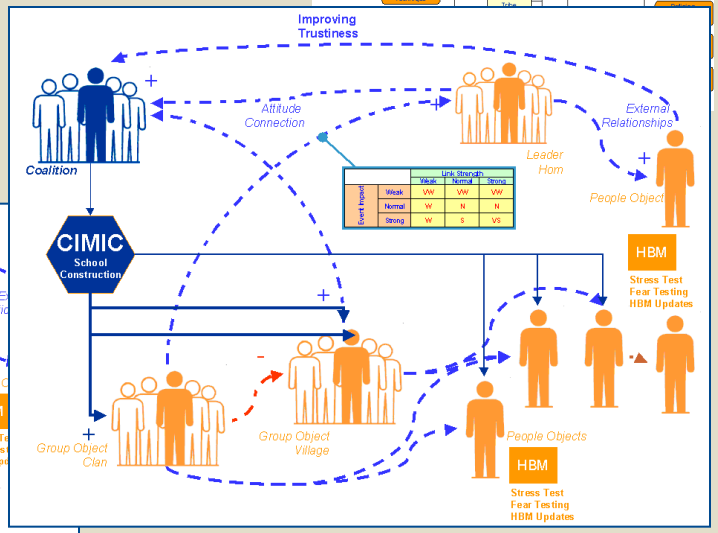
Relationships among People, Interest Groups and Forces

- **Population Generation Process**
- **Social Network Generation & Compatibility Algorithms**



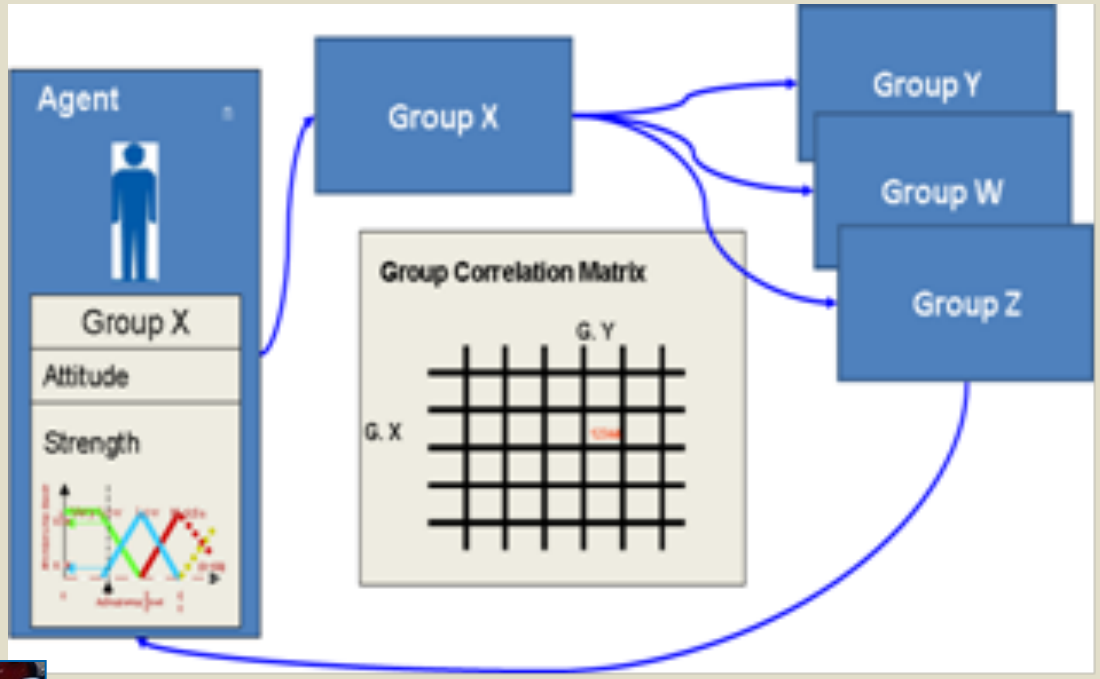


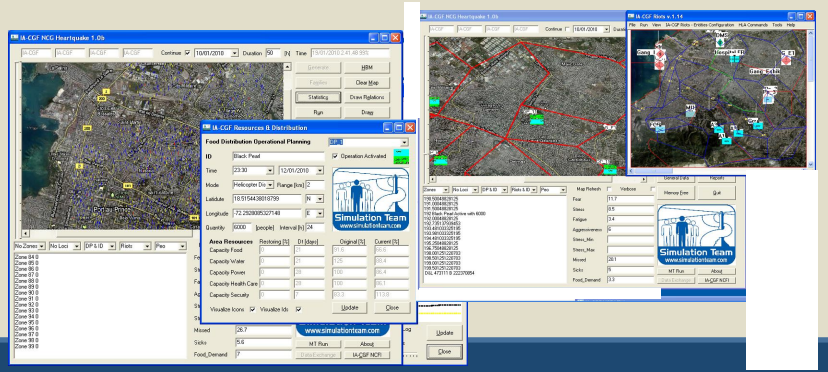




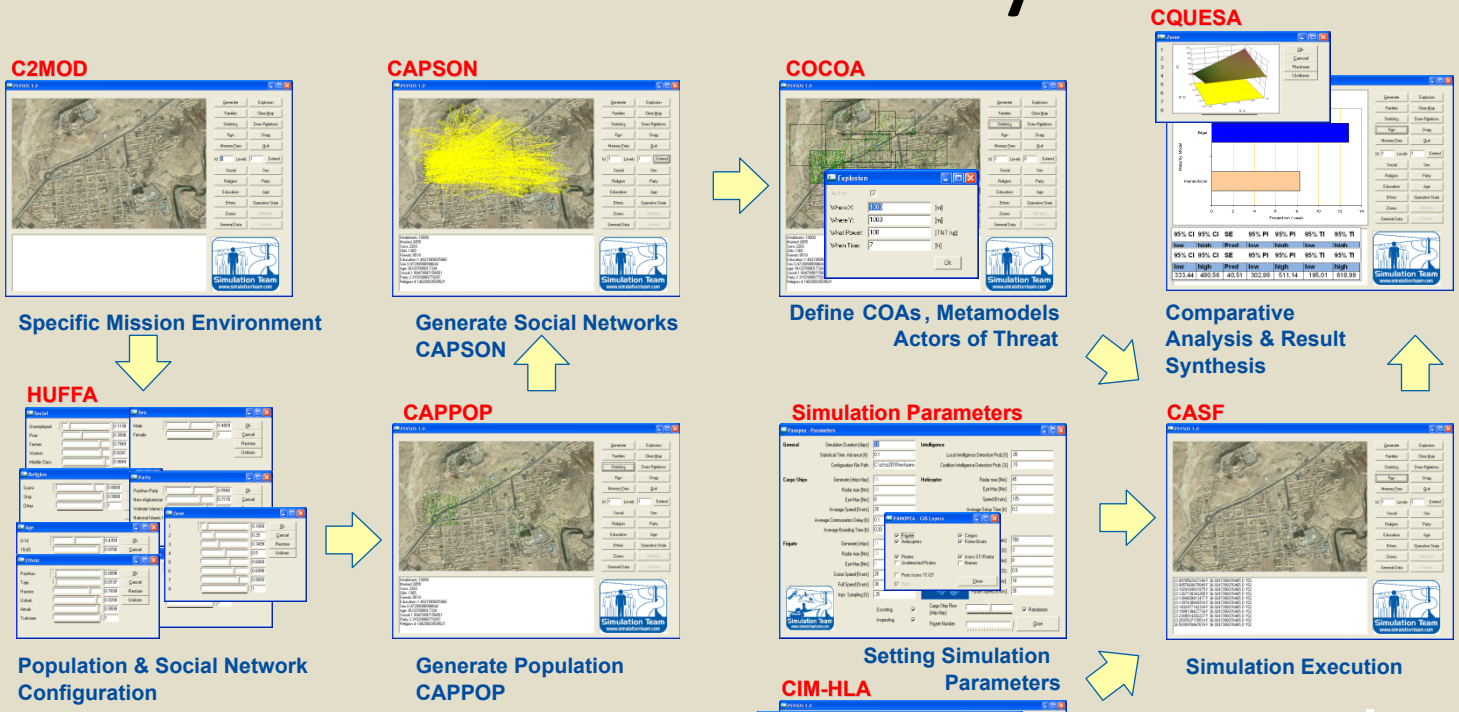
Population Model & Fuzzy Logic

Sample of influence of correlation between groups based on Fuzzy Logic





Generating Population, Social Networks and Layers



This approach was used in IA-CGF Haiti, CAPRICORN, CGF C4 IT and others projects developed by Simulation Team

Conclusions

SIMCJOH Research Programme is a bottom-up initiative of a single Nation (Italy) that is trying to meet the military needs on capability development, identified through a top-down process. The expertise of Simulation Team University of Genoa together with the know-how of the Italian Industry and the excellence of NATO M&S CoE are proactively seeking for a tool that will support military operations in crisis management, where the human factor is the key for Success. The relevance of this initiative resides in the inputs that could provide to the development of IA based Simulation as well as the support to the transformational effort of NATO, contributing to fill the gap of the identified Capability Shortfall on Human Factors.