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IASTED International Conference

PowerCon 2003

Special Theme: **BLACKOUT**

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"Introduction to the Modeling of Complex Large-Scale Disaster/Blackout Management"

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From the perspective of the modern society, hazard/ crisis/ disaster/ emergency/ blackout management is always more and more important. This complex human activity is performed in long and short time scales and involves local, regional, national and international resources. Large scale disasters have different sources, different propagation and require many different human and technological responses, but in every case, such generic activities as situation assessment, decision-making and intervention coordination are necessary. They have many common properties and from the complex systems perspective, they should be modelled according to the same methodological frameworks.

Meta-modelling conceptual tools provides an introduction to the modelling. This tutorial is based on general system, engineering and human-centred socio-cognitive paradigms. It will provide an integrated point of view on the generic concepts and modelling methodology involved in a crisis/disaster/blackout management and in its socio-cognitive-environment-technological contexts, which take under consideration human factors, human errors and managerial mismanagement, for instance, in the case of Large Complex Critical Infrastructures (LCCI).

The tutorial will focus on the essential meta-modelling conceptualisation of large-scale global technological disasters, terminology involved, human factors, safety criteria and will provide the proposal of a systemic methodological

framework for the top-down complete and congruent modelling of blackout domains, emergency organizations, their dynamics, intervention strategies and external constraints. The application of the TOGA (Top-down Object-based Goal-oriented Approach) meta-theory is illustrated, and some examples related to concrete emergency management tasks will also be demonstrated.

A generalized integrated vision of the hazard/crisis/disaster/emergency/blackout management will be presented as a conceptual platform for the unification of different local and national approaches; it is necessary for:

- establishing of common languages (ontology) for emergency/disaster policy makers and domain operators
- unification and standardization of the procedures and strategies on international cooperation levels
- development of cross-national information and knowledge exchange networks/grids
- development of worldwide standardized components technologies for the information and active decision support systems for emergency operators

We may expect that the development of global disaster management grids supported by advanced intelligent technologies networks will be one of the most important challengers for the 21st century. Therefore, this tutorial is intended for all people involved in emergency/disaster planning and management who wish to increase their own efficacy, comprehend better new emerging trends, as well as for those who are going to participate actively in their development.

Dr. Adam Maria Gadomski received his MSc in nuclear physics from the Warsaw University, and his doctoral degree from the Physics Faculty at the "La Sapienza" University of Rome. He has worked with ENEA since 1984. He is a member of international scientific boards related to intelligent agents technologies, system and cognitive sciences, and emergency management. He participated in several International Atomic Energy Agency (IAEA) and EU projects. Among previous appointments, Dr. Gadomski has been Assistant Professor, head of Identification and Diagnostic Lab at the Institute of Atomic Energy of Poland, and co-ordinator of the Computer-System Project for the Polish National Centre of Oncology. He contributed in particular to modelling methodologies and ontology of complex human-based systems, decision-support for high-risk large aggregates management in emergency situations, and he is a promoter of intelligence-based socio-cognitive engineering initiatives. He is also the author of about 120 scientific papers and the knowledge ordering (meta-) theory TOGA (Top-down Object-based Goal-oriented Approach). He also funded the High-Intelligence and Decision Research Group (HID) at the ENEA's CAMO. More information can be found at <http://erg4146.casaccia.enea.it/gad-bio-en.htm>

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