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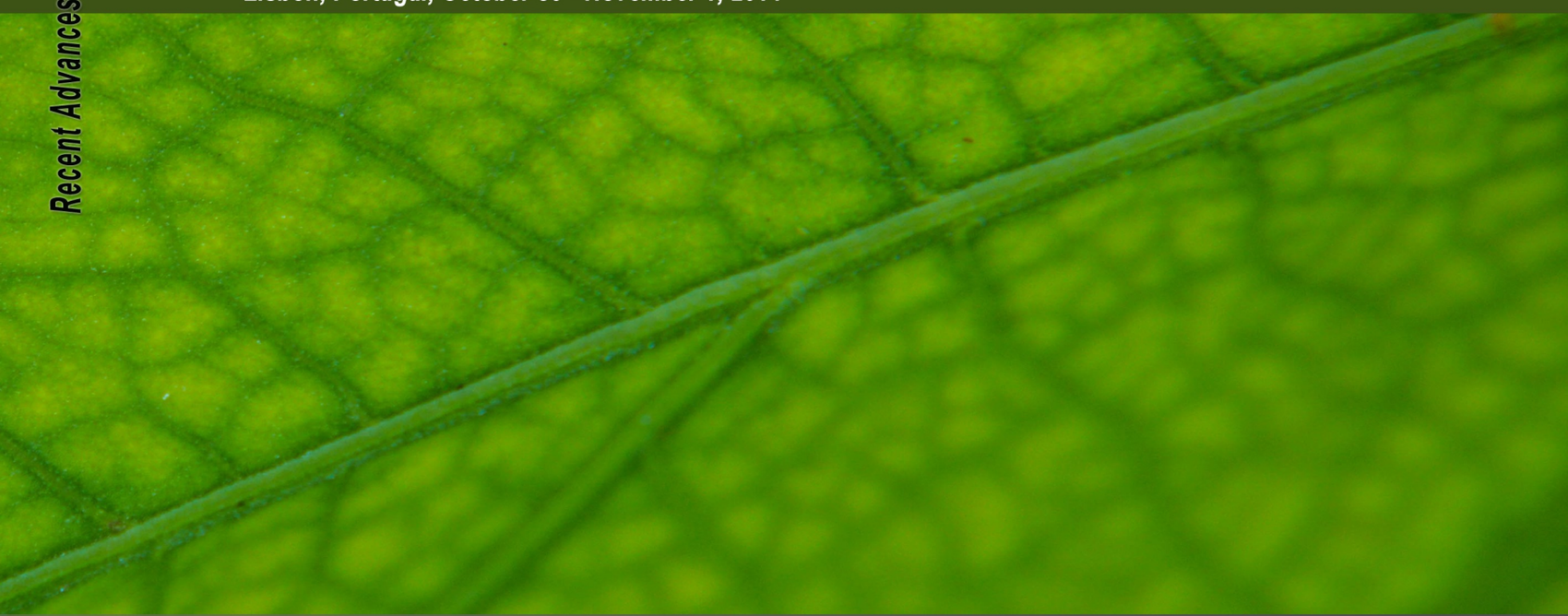
Recent Advances in Environmental Science and Biomedicine

Proceedings of the 8th International Conference on Energy and Development, Environment and Biomedicine (EDEB '14)

Lisbon, Portugal, October 30 - November 1, 2014

Recent Advances in Environmental Science and Biomedicine



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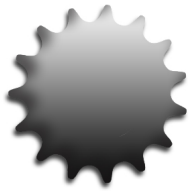

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Plenary Lecture 1

Design of Contingency Plan to Combat an Oil Spill Approaching the Seashore

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Abstract: Several accidents in oil transport by tankers have provided effective object lessons on the futility of oil spill contingency plans that are based on inadequate response action, contain imprecise environmental risk assessment, or fail to address the basic issues of cleanup technology, worker safety, and final disposal. Nowadays, a major effort has been directed towards improving such planning for large areas in open sea but also along the coast. This last issue is of main importance for closed seas like the Mediterranean, where, in parallel with the usual oil transportation, offshore drilling for hydrocarbon fields exportation is expected to increase risk due to accidental or/and systematic pollution of seawater.
The present work deals with the design of a contingency plan for immediate response to oil spill approaching a coast of important characteristics due to either sensitive ecosystems or/and special installations (e.g., for desalination or aquaculture) or/and touristic/recreational activities. We have achieved this task by (i) developing an interactive algorithmic procedure through logical/dynamic programming and (ii) incorporating this procedure into the empty shell of an expert system, where the Knowledge Base is continually enriched through case based reasoning (CBR) while the corresponding Inference Engine is a multicriteria tool operating in a fuzzy version to count for uncertainty. An implementation of this methodology, concerning scenario of probable pollution of an island of the East Aegean Sea sited near the corridor of tankers coming from Black Sea, is presented and the results are discussed.

Brief Biography of the Speaker: Prof. Fragiskos Batzias holds a 5years Diploma and a PhD degree in Chemical Engineering, and a BSc in Economics. He has also studied Mathematics and Philosophy. He is Director of the Laboratory of Simulation of Industrial Processes and Head of the Research Group on Systems Analysis at the Department of Industrial Management and Technology of the University of Piraeus, Greece. He is teaching at the interdepartmental postgraduate courses (i) Systems of Energy Management and Protection of the Environment, running by the University of Piraeus in cooperation with the Chem. Eng. Dept. of the Nat. Tech. Univ. of Athens, and (ii) Techno-Economic Systems, running by the Electr. & Comp. Eng. Dept. of the Nat. Tech. Univ. of Athens in cooperation with the University of Athens and the University of Piraeus. His research interests are in chemical engineering systems analysis and knowledge based decision making. He has >100 publications in highly ranked journals and conference proceedings, including 29 research monographs in collective volumes, with 171 citations and an h-index of 8 (for the period 2004-2012, source: ISI Web of Science, Thompson Scientific; self-citations have been excluded).
He has participated (and chaired after invitation from the organizers) in prestigious international conferences, such as those organized periodically by the IEEE, the European Federation of Chemical Engineering (EFCE), the DECHEMA, CHISA, WSEAS Organizations. He organizes the annual Symposium on Industrial and Environmental Case Studies running successfully since 2004 within the International Conference of Computational Methods in Sciences and Engineering (ICCMSE).