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Fragiskos Batzias

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Recent Advances in Energy, Environment and Financial Planning

Proceedings of the 5th International Conference on Development, Energy, Environment, Economics (DEEE '14)

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Table of Contents

Plenary Lecture 1

On the Tradeoff between Spatiotemporal Criteria in Selecting / Evaluating / Ranking Environmental Protection Methods Applied to Waterbodies

Professor Fragiskos Batzias
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Abstract: The criteria used in selecting / evaluating / ranking environmental protection methods applied to waterbodies may form a tradeoff, in which case the equilibrium point determines the optimal value of the control / independent / explanatory variable each time under consideration. An example of such an independent variable is the concentration of biocide in ballast water, while the dependent variables represent the partial benefit referring to (i) the degree of elimination of invasive species in ballast water stored onboard, and (ii) the avoidance of environmental damage due to toxic substances remaining in discharged seawater when deballasting takes place near the destination port. Another example of such an independent variable is the amount of dispersant applied in seawater after an oil spill has been setup, due to either accidental or systematic pollution with liquid hydrocarbon mixture (usually crude oil or diesel or majout): the higher this amount the higher the indirect partial cost due to seawater ecosystem damage but the lesser the direct cost due to oil spill surface layer hindering air diffusion and sunlight penetration leading to oxygen deficit and photosynthesis limitation, respectively.
To deal with this problem, we have designed/developed/implemented a methodological framework under the form of an algorithmic procedure, making use of decomposition techniques and Case/Rules / Model Based Reasoning (CBR/RBR/MBR) within a dynamic ontological network. This methodology has been applied to two simulation events, river pollution and shoreline environmental management, in northern Greece and the Aegean Sea, respectively. Advanced environmental indices are synthesized to represent complex situations and the results are discusses in comparison with (i) the methodology introduced herein (meta-analysis), and (ii) similar studies selected from relevant technical literature, where simpler techniques have been used.

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).

Plenary Lecture 2

New Concept of Hybrid Thermophotovoltaic Industrial Prototypes

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Abstract: Hybrid PVT (thermophotovoltaic) panels allow the direct transformation of solar radiation into electricity and the production of solar thermal energy on the same surface. Based on the results obtained in previous research literature , PV/T collectors produce more energy per unit surface area than one PV panel and one thermal collector next to each other. A lot of parameters affects PV/T performance (both electrical and thermal) such as covered versus uncovered PV/T collectors, optimum mass flow rate, absorber plate parameters (i.e. tube spacing, tube diameter, fin thickness), absorber to fluid thermal conductance and configuration design types. Based on an exergy and cost analysis,water PVT glazed flat plate collector system results the most promising to develop [Zondag-1999].
Our research work, starting from the numerical analysis using genetic algorithms in order to identify the geometry of the heat sink that allows the best thermal and consequently electrical performance, is finalized to the construction and experimental characterization of new hybrid prototypes for a wide range of industrial and other sectors applications (boats, vehicles, houses, etc.).

Brief Biography of the Speaker: Giampietro Fabbri was Born in Bologna on the 17th March 1964.
In 1983 he obtained the Classical High School Degree at the Lyceon Gymnasium Luigi Galvani in Bologna.
In 1988 he obtained the Unversity Degree cum laude in Electonic Engineeing at the University of Bologna.
In 1992 he obtained the degree in Musical Composition at the Giovanni Battista Martini Conservatoir in Bologna.
From 1992 to 1998 he has been University Researcher at the University of Bologna in the Nuclear Plants field.
In 1993 he obtained the Research Doctorate degree in Bioingeneering.
From 1998 to 2000 he has been University Researcher at the University of Bologna in the Technical Physic field.
From 2000 to 2004 he has been Associate Professor at the University of Bologna in the Technical Physic field.
Since 2004 he is Full Professor at the University of Bologna in the Technical Physic field.
From 1992 to 1995 he has been member of the Institute of Technical Physic.
From 1995 to 2012 he has been member of the Department of Energy, Nuclear, and Environmental Control Engineering (DIENCA).
Since 2012 he is member of the Department of Inudstrial Engineering (DIN).