

Anagnostopoulos, K. (DUTH, Department of Production Engineering and Management, School of Engineering)
Koulinas, G.

Εξομάλυνση της Χρήσης Πόρων σε Έργα με Υπερευρετικούς Αλγορίθμους (Resource Leveling Using Hyperheuristic Algorithms)

Tech. Chron. Sci J.T.C.G., I, May – Aug. 2010, vol. 1, no 2, pp. 15-24, tab. 1, 13 ref.

In this paper two simple hyper heuristic algorithms for resource leveling are proposed. A hyper heuristic algorithm operates in the heuristics domain rather than in the solutions domain. A set of “low level” heuristics operates in the current solution neighborhood. The first hyper heuristic selects a “low level” heuristic based on its previous average performance. The second hyper heuristic works as a multistart greedy algorithm. Both algorithms have been programmed in Microsoft Project, and a comparison with the software’s standard algorithm has been performed on an example project.

(Authors)

K-W: Critical Path Method, Resource Leveling

Karamperidou, Ch.

Vafeiadis, M., Katsifarakis, K. (A.U.Th., Department of Civil Engineering, Division of Hydraulics and Environmental Engineering)

Διαχείριση Παράκτιων Υδροφορέων με Χρήση Τεχνητών Νευρωνικών Δικτύων (Optimization of Groundwater Resource Management by Means of Artificial Neural Networks)

Tech. Chron. Sci J.T.C.G., I, May – Aug. 2010, vol. 1, no 2, pp. 25-32, tab. , 29 ref.

Seawater intrusion into coastal aquifers is an important problem worldwide, since it renders groundwater unusable for drinking or irrigation. For this reason, the respective scientific literature is very rich. The present paper addresses the issue of training an artificial neural network (ANN) in order to estimate the total volume of salt water that is pumped from a coastal aquifer in Eastern Macedonia, Greece.

The ANN used consists of input neurons that represent the wells’ pumping rate, one hidden layer and a single output neuron that represents the volume of seawater that is pumped from the wells. The network uses the Quickprop Algorithm, a method of speeding back-propagation style training that was developed by Fahlman; the training patterns are derived from numerical flow simulations, by means of a Boundary Element Code.

The correlation achieved between expected and estimated values of seawater intrusion, although highly dependent on the training data, encourages further investigation that should include training the ANN with actual field data. The final product, namely a well trained ANN, could be easily used, even by non-specialists, in the study of basin-scale water resource management problems.

(Authors)

K-W: Groundwater, Groundwater Management, Optimization, Neural Networks

Anagnostopoulos, K. (DUTH, Department of Production Engineering and Management, School of Engineering)
Kotsikas, L.

Κατασκευή της Καμπύλης Αντιστάθμισης Χρόνου-Κόστους σε Δίκτυα Δραστηριοτήτων με έναν Υβριδικό Αλγόριθμο (Construction of the Time-Cost Trade-off Curve in Activity Networks Using a Hybrid Algorithm)

Tech. Chron. Sci J.T.C.G., I, May – Aug. 2010, vol. 1, no 2, pp. 33-44, tab. 11, 20 ref.

Since the duration of an activity can be decreased if more resources are given for its realization, thus increasing its direct cost, the need for choosing the appropriate resources arises in project scheduling. In this paper, a hybrid algorithm is proposed for constructing the time-cost trade-off curve, in projects with discrete time-cost combinations in the activities. The algorithm consists of a genetic algorithm, which is hybridized by incorporating a heuristic algorithm in order to improve its performance. An extensive computational analysis is also performed.

(Authors)

K-W: Time – Cast, Trade – Off Curve, Activity Networks, Algorithm Hybrid

Savva, A. (DUTH, Sch. of Civil Engineering)

Σκυροδέματα με ανακυκλωμένα αδρανή: Επίδραση της ομοιογένειας του σκυροδέματος προέλευσης (Recycled Aggregate Concrete: Effect of Homogeneity of Origin Concrete)

Tech. Chron. Sci J.T.C.G., I, May – Aug. 2010, vol. 1, no 2, pp. 45-62, tab. 7, 32 ref.

In the context of sustainable development, recycling and usage of demolished concrete consists an alternative for natural resources, as well for the construction waste landfill. This waste concrete could be used as aggregate and thus a concrete made with such recycled aggregates is a material friendly to the environment. This paper examines the effect of homogeneity of origin concrete to the splitting and compressive strength of recycled aggregate concretes up to the age of six months at 20 °C and to compressive strength after heating for 2h at 100, 300 και 550 °C. The same concretes are also testing concerning their resistance to chlorines, when the ions penetrate either through their bottom side or after 28 days wetting-drying cycles. There are concretes made with 100% recycled aggregates as well others made with only the coarse aggregate recycled. The recycled aggregates produced from concretes either of uniform quality and age or others taken from tested conventional cubic specimen of different ages and strengths. The way in which the tested properties are affected varies, related to the homogeneity of the original concrete.

(Author)

K-W: Concrete, Recycled Aggregate, Concrete Durability

Kaltsounis, A., Gavathas, A., Dimitriou, L.

Προσδιορισμός Επιπέδου Εξυπηρέτησης και Αξιολόγησης Τυπικής Διατομής Αττικής Οδού (Evaluation of the Typical Cross-Sections of Attiki Odos, Athens, Greece)

Tech. Chron. Sci J.T.C.G., I, May – Aug. 2010, vol. 1, no 2, pp. 63-84, tab. 36, 17 ref.

Since the start of its operation, the Attiki Odos highway (AO) has absorbed a large volume of traffic flow within the Attica region. On its completion, the phenomenon of saturation was observed during rush hours and in certain sections. Using our own and published measurements of traffic flow, the Level of Service (LoS) of two sections of Attica Road was calculated: between the junctions of Kifisias and Kymis, and between the junctions of Penteli and Kifisias. The LoS was calculated based on the ideal flow, the factor of Heavy Vehicles, the factor of not Familiarized Users and the final calculated real flow. The results show that LoS is between E and F during morning peak, between D and E during midday peak, and between C and D during afternoon peak in both sections. As a conclusion, in order to achieve a sufficient LoS, unified pricing, regardless of covered distance, and the readjustment of toll per regular time interval are necessary.

(Authors)

K-W: Traffic Engineering, Level of Service, Road Cross Section, Motorway, Road Capacity

Stefanou, J. (NTUA, Department of Urban and Regional Planning)

Michalena, E.

Σύγχρονες Χωρικές Έννοιες & Ανανεώσιμες Πηγές Ενέργειας (Current Spatial Concepts & Renewable Energy Sources)

Tech. Chron. Sci J.T.C.G., II, May – Aug. 2010, vol. 1, no 2, pp. 85-98, tab. , 83 ref.

Given the particularity and the variety of the charismatic Hellenic landscape, the impasse created by the lack of a Special National Plan for the planning of renewable energy projects in the Hellenic territories could eventually be overcome by scientific innovative terms and spatial formulations by researchers with long experience in dealing with the subjects of environmental protection, landscape physiognomy, landscape architecture, the aesthetic approach to energy equipment, and ecologic spatial planning. In this paper, the present framework for spatial integration of renewable energy projects will be presented, as well as the terms mentioned above; their possible application as a solution to the problems created by the dispersed and unprincipled integration of renewable energies in the territories, will be researched.

(Authors)

K-W: Land Scale, Sustainable Land Scale, Regional Planning, Renewable Energy

Daniil, M.

Τελικό Αρχιτεκτονικό Προϊόν και Αντίληψη του Χρήστη. Ζητήματα Ταυτότητας και Σχεδιασμού του Εμπορικού Κέντρου (Final Architectural Product and The User's Perception. Studies of the Identity and Design of the Shopping Center)

Tech. Chron. Sci J.T.C.G., II, May – Aug. 2010, vol. 1, no 2, pp. 99-111, tab. , 27 ref.

Much of the research on the built environment increasingly turns to the exploration of the borderlines between “public” and “private” and on the ways we perceive the city and its function. The Shopping Center, a “collective” space that today surpasses the narrow limits of its commercial use and seems to function as a leisure time space, a private space intended for public use, a new activity-condenser, can serve as a paradigm in the study of the phenomenon of the overlapping of the public and private spheres. The present paper aims to explore the identity of the Shopping Center and to examine its functional role within the contemporary public realm. It also aims to contribute to design issues concerning this specific commercial building type. The exploration of the Shopping Center's identity is realized through field research conducted on such a space in Thessaloniki. The field research attempted, in particular, to explore the identity of the lived-in space, the character of the final architectural product, which is now “inhabited” by its users. Is the Shopping Center a public or a private space, a business-consumer space or a collective social interaction field; is it a place or a “non-place”? Based on these questions -which shaped the main research axes-, the Shopping Center's identity, as perceived and evaluated by the users, is structured. The research findings are generalized, through scientific statistical tools, to show main population tendencies and to establish broader concern about the role of the Shopping Center within the contemporary Greek city.

(Author)

K-W: Shopping – Centre, Private Space, Public Space, Identity of Space, Design of Public Space, Social Space, Collective Space

Exadaktylos, A.

Το Υδραγωγείο του «Κουφού» στη Χίο. Ιστορικά και Κατασκευαστικά Στοιχεία (The Aqueduct Of “Koufos” In Chios. Historical and Structural Data)

Tech. Chron. Sci J.T.C.G., II, May – Aug. 2010, vol. 1, no 2, pp. 113-121, tab. , 5 ref.

This study indicates the importance of water in the defence of fortifications, the role of reservoirs in aqueducts and the technical-economical problems of construction and maintenance. It also analyses one of the three aqueducts of Chios town, the aqueduct of Koufos, which used to conduct water to the Castle from the spring of St. George Resta (Agios Georgios Resta). Prototype data are cited for the aqueduct route, such as small-scale structures and segments of water pipelines. It also describes the most important construction of the aqueduct, which is the aquabridge above the torrent Koufos, and from bibliographical data tries to determine the period in which the aqueduct stopped functioning. Unfortunately, the causes of the aqueduct's failure are not mentioned in the literature. Some calculations are also cited to estimate the flow rate of the aqueduct and the time needed to fill the Kria Vrissi cistern, which was probably fed by this aqueduct. The same aqueduct seems to have been used to feed the baths located at the entrance to the Castle of the water pipeline.

(Author)

K-W: Aqueducts, Aquabridge

Mitoula, R. (Harokopio University of Athens, Department of Home Economics and Ecology)

Η Βιωσιμότητα των Πόλεων στο Πλαίσιο της Ε.Ε. στη Νέα Προγραμματική Περίοδο 2007-2013 (Sustainability Of Cities In The Frame Of E.U. Policies In New Programming Period 2007-2013)

Tech. Chron. Sci J.T.C.G., II, May – Aug. 2010, vol. 1, no 2, pp. 123-133, tab. , 32 ref.

The present paper examines the role of the EU in the development of sustainable cities during the 4th Programming Period from 2007 to 2013. The sustainability of urban centres is given several interpretations, each one of which emphasises specific operational roles in relation to a plan for confronting deficiencies in infrastructure. Furthermore, these interpretations underline economic sustainability as a competitive productive model. In addition to the above, sustainability is viewed in terms of its effective administration model. With respect to the regional policy, the subject of the research is formed in relation to the 4th CFS, the various Community Policies and the financial instruments that apply to the cities in a direct or indirect way.

(Author)

K-W: Sustainable Development, Sustainable Development of Cities, European Union

Poulakos, G. (NTUA, , Department of Architectural Technology, Sound Laboratory)

Ιδιότητες και Συμπεριφορά Δαπέδων σε Σχέση με τη Θερμότητα (Thermal Properties and Behaviour of Floors)

Tech. Chron. Sci J.T.C.G., II, May – Aug. 2010, vol. 1 no 2, pp. 135-150, tab. 8, 12 ref.

This paper analyses the effect of floor substrates on the thermal behaviour of floors in interior spaces, as well as on the thermal sensation of the inhabitants. For this reason, the thermal and physical properties of commonly used flooring materials, such as concrete, marble, terazzo, ceramic tiles, gravel concrete, perlite concrete and mortars, Swedish pine, Slovenian oak and beech, African Limba, particleboard, middle density fibreboard, plastic tile, polystyrene, asphalt material, cork tile, mixture of cork-rubber and acrylic carpet, are presented and studied. Firstly, according to the thermal sensation that is induced, floors are classified from “very cold” to “very hot”, depending on the thermal effusivity of the material. Furthermore, the thermal behaviour of six types of floors with substrates is studied according to the thermal sensation. From the analysis of the results of the study, useful conclusions are drawn concerning the use of materials for the construction of floors for interior spaces.

(Author)

K-W: Flooring Materials, Thermal Behaviour