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Using Genetic Algorithm to Organize Sustainable Urban Landscape in Historical Part of City

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Abstract : The urban development process in the historical urban context has predominately witnessed two main approaches: the first is the Preservation and conservation of the urban fabric and its value, and the second approach is urban renewal and redevelopment. The latter is generally supported by political and economic aspirations. These two approaches conflict evidently. The authors go through the history of urban planning in order to review the historical development of the mentioned approaches. In this article, various values which are inherent in the historical fabric of a city are illustrated by emphasizing on cultural identity and activity. In the following, it is tried to find an optimized plan which maximizes economic development and minimizes change in historical-cultural sites simultaneously. In the proposed model, regarding the decision maker's intention, and the variety of functions, the selected zone is divided into a number of components. For each component, different alternatives can be assigned, namely, renovation, refurbishment, destruction, and change in function. The decision Variable in this model is to choose an alternative for each component. A set of decisions made upon all components results in a plan. A plan developed in this way can be evaluated based on the decision maker's point of view. That is, interactions between selected alternatives can make a foundation for the assessment of urban context to design a historical-cultural landscape. A genetic algorithm (GA) approach is used to search for optimal future land use within the historical-culture landscape for a sustainable high-growth city.

Keywords : urban sustainability, green city, regeneration, genetic algorithm
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