

PADI: a Software to Support Park Design

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Designing urban and open spaces is a fundamental activity of urbanists and landscape architects. Designers can currently use various kinds of CAD tools which enable them to draw various kinds of plans and site views in 2D or 3D. However, these tools do not provide automatic capabilities to help the designer to find a design which satisfies the project goals and the various site constraints (slopes percentages, soil nature, vegetation, interesting spots, etc.). Designing a park is mainly a problem of identifying which elements should be created in the environmental setting and deciding where to locate them. Molnar and Rutledge (1986) proposed several guidelines for park design in a comprehensive method which can be applied manually.

Starting from this method we developed PADI (Park Design Artificial Intelligence), a software which enables the designer to do several things: 1) define a project in terms of use areas (i.e. pick-nick areas, rest areas, playgrounds, camp areas, etc.); 2) define the functional constraints applying on these use-areas in terms of attraction and repulsion relations and draw a functional diagram of these constraints between circles symbolizing the use areas; 3) create an interpretation map of the site for each site constraints (slopes, soil nature, vegetation, etc.) that he wishes to deal with in the design; 4) visualize the diagram of functional constraints on top of the interpretation maps; 5) manually modify the positions of the use areas on the site map in order to minimize the site constraints while respecting the functional constraints.

In addition, PADI contains a case base which provides the designer with examples of functional diagrams corresponding to existing parks which have characteristics similar to the current project. Finally, the tool contains a module which automatically finds solutions to the design problem and proposes them to the designer. This module is based on several artificial intelligence techniques.

PADI is implemented in C++ and uses Geomedia as a library providing GIS functions.

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Presentation: We would like to present **a poster and a demonstration.**