

Proposal of a New Approach for Simulating Transformations of a Built Environment - Case of Saint-Laurent Shop Fronts in Montréal -

by

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Abstract. Town's heritage is the physical trace of its citizens and the living memory of its history. In this view, it gives next generations a better knowledge of their origins, and an improved visibility of the future of their shared space. Consequently, new architectural projects need to reinforce this historical progression, in which they are indeed a fleeting step. The aim of this research is to establish a convenient method that helps project's actors to explore an area of architectural propositions, without drafting them. The case study considers the problem of shop fronts renovation in Saint-Laurent Boulevard in Montreal city. By simulating architectural compositions, users are allowed to determine those who meet formalized criteria, and go with architectural characteristics of the site they will be inserted in. For this reason, we combine "actions' modeling" approach and "optimization technique" (using genetic algorithms) to develop an evolutionary modeling method that helps generating propositions for architectural composition problems. A new CAD environment is implemented to support this method. A number of tests, discussed at the end of the paper, conclude that this method is able to help users filtering relevant architectural options among a large number of computationally generated propositions. Further perspectives are drawn for coming developments.

Keywords: Evolutionary modeling, Actions' modeling, Genetic algorithms, Architecture composition, Patrimonial architecture.