An Automated Construction Innovation Model to Meet Future Construction Challenges

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Abstract

Pursuing sustainable development has been considered the most critical issue in the future construction industry. Among the many approaches to achieve sustainable development, construction innovation provides one of the most promising and effective solutions. This paper presents the preliminary result of a recent research project on Automated Construction innovation Model (ACTIM) that can generate innovative construction methods automatically with a novel approach that integrates a text mining technique, patent analysis, and Genetic Algorithm (GA). Previous technological information stored in the public patent databases is adopted as the knowledge repository for building the function model of the target construction method. It is then transformed into a genetic operation tree (GOT) for evolving with GA. Finally, the innovative solution is recovered as a function model and realized in a 3D model. An example of road construction manhole technology is selected for illustration of the proposed ACTIM method. The preliminary results show that the proposed ACTIM provides a promising tool for construction engineers and managers to meet future challenges in achieving sustainable development.

Keyword：Computer aided innovation, TRIZ, Genetic operation tree, Construction technology innovation.