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Abstract

Since the pioneering work of Lowry in the 1960s, many urban models has developed to understand how urban systems work and change. Early urban models tend to focus on the relationship and interaction between land use and transportation. Yet, recent urban models pay more attention to urban morphology with an interest on self-organising nature of urban systems.

Agent based urban modelling approach is gaining popularity as a new means to study an urban systems in this context. The methodology has roots in the natural science field such as the complexity science, but it also provides meaningful insights for social systems as well as urban systems. The key strength is that it offers a way to understand urban systems through the interaction among individual members in the systems such as households and developers.

This research aims to develop an agent based urban model as a new scientific tool to understand changes in urban systems and to support planning policy making. It starts with reviewing history and issue in urban modeling and then move on the trend of urban development in general and in Korea. The research then defines the key behaviour and algorithms of the model before developing it as a functional computer program. We developed the model by using an open source programming platform, Repast Simphony. Then the model was applied to a case study area of Busan Metropolitan Area(Busan, Gimhae, Yangsan) to see if it properly works and generates valid simulation outcomes. We has confirmed that the model offers new and meaningful ways to understand urban future and to support planning policy.

Yet, the model developed in this study is subject to further development. It is necessary to analyse more empirical data on agents' type and behaviour. At the same time, it is desirable to improve technical interfaces to make is as a planning support system. These require continued research and development.

Academic Discipline and Sub-Disciplines : Urban model

Keywords : Agent based model; Urban growth; Urban model