An Overview of Domain Models of Urban Quantitative Analysis

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Abstract : Nowadays, intelligent research technology is more and more important than traditional research methods in urban research work, and this proportion will greatly increase in the next few decades. Frequently such analyzing work cannot be carried without some software engineering knowledge. And here, domain models of urban research will be necessary when applying software engineering knowledge to urban work. In many urban plan practice projects, making rational models, feeding reliable data, and providing enough computation all make indispensable assistance in producing good urban planning. During the whole work process, domain models can optimize workflow design. At present, human beings have entered the era of big data. The amount of digital data generated by cities every day will increase at an exponential rate, and new data forms are constantly emerging. How to select a suitable data set from the massive amount of data, manage and process it has become an ability that more and more planners and urban researchers need to possess. This paper summarizes and makes predictions of the emergence of technologies and technological iterations that may affect urban research in the future, discover urban problems, and implement targeted sustainable urban strategies. They are summarized into seven major domain models. They are urban and rural regional domain model, urban ecological domain model, urban industry domain model, development dynamic domain model, urban social and cultural domain model, urban traffic domain model, and urban space domain model. These seven domain models can be used to guide the construction of systematic urban research topics and help researchers organize a series of intelligent analytical tools, such as Python, R, GIS, etc. These seven models make full use of quantitative spatial analysis, machine learning, and other technologies to achieve higher efficiency and accuracy in urban research, assisting people in making reasonable decisions.

Keywords : big data, domain model, urban planning, urban quantitative analysis, machine learning, workflow design

Conference Title : ICUPM 2021 : International Conference on Computers in Urban Planning and Management
Conference Location : Bangkok, Thailand
Conference Dates : November 29-30, 2021