

A citation network analysis of a scientific landscape in urban modeling

Abstract proposal

Applied Network Science

Special Issue Complexity and the City

JUSTE RAIMBAULT^{1,2,3}

¹ UPS CNRS 3611 ISC-PIF

² CASA, UCL

³ UMR CNRS 8504 Géographie-cités

Keywords: *Citation network; Interdisciplinarity; Urban Modeling; Land-use Transport Interaction models; Microsimulation models*

Several modeling approaches to the evolution of urban and territorial environments have been introduced in the literature, providing complementary viewpoints and methods. This paper contributes to the mapping of this scientific landscape by a citation network analysis. Taking the case study of two landmark types of operational models, namely microsimulation models and land-use transport interaction model, we construct an initial corpus through keyword requests. The backward citation network is then reconstructed up to depth two, yielding a network with $1.47 \cdot 10^5$ nodes and $2.10 \cdot 10^5$ citation links. Community detection in the network provides endogenous disciplines and approaches, including a broader scope than the initial corpus, with for example spatial statistics and agent-based modeling. We construct measures of interdisciplinarity to identify bridge papers, and investigate possible missing connections. We illustrate these more particularly with the interface of microsimulation, agent-based modeling and land-use transport models, and discuss potential coupling of models filling this gap. We show therein how potential research directions can be unveiled through citation network analysis and provide partial maps of science in the field of urban modeling, which can be used by researchers and practitioners to better contextualize their modeling approaches.