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Abstract

For better management of parking a good balance between the supply and demand is required. This can be achieved by using a tool that can support the development of efficient parking policies. The basis of the current research is to optimize the use of PARKAGENT, an agent based geosimulation model, used for simulating parking search in a city. It serves as tool for the analysis of parking policy by helping decision-makers to explore policy alternatives and identifying their impacts on drivers, residents, and the resources of the city. The current study mainly focuses on two developments: (i) Exploring the sensitivity of PARKAGENT and (ii) Connecting the activity based model FEATHERS to PARKAGENT. FEATHERS is an activity-based transportation forecasting model framework for predicting traffic demands. It simulates daily activity pattern of individuals and functions as a policy measure by predicting how people change their activity-travel behaviours in response to a new transportation policy. In order to determine which parameters are the key drivers of PARKAGENT model's results, a sensitivity analysis will be performed. This will help to evaluate the impact of the variation in input on car parking patterns? In other words, what is the variation in the simulation outcomes using different parameter settings? Also, what is the effect of the demand (cars searching for parking spaces) and supply (parking spaces) on these sensitivities. This study also proposes connection between PARKAGENT and FEATHERS, in order to enhance the capability of data spatial analysis in the model framework. Although the FEATHERS system shows enough performance in forecasting transportation demand to evaluate a policy, its performance can further be enhanced by integrating it with additional models such as PARKAGENT. The coupling is performed by obtaining OD matrices from FEATHERS, and by reading in these OD matrices in PARKAGENT. PARKAGENT needs to be extended in such a way that the OD matrices can be read and converted to counts of cars entering and leaving the study area during the day. In this way integration between the output of FEATHERS and input of PARKAGENT will be created.

Keywords

Agent based parking simulation model, PARKAGENT, Activity based model, FEATHERS, Sensitivity analysis.

Short description

In this paper we are trying to enhance the performance of the PARKAGENT model by exploring the impact of the variation in the inputs (key parameters) on the outcomes of the model. On other hand, what is the effect of the demand (cars looking for parking lots) and supply (the parking lots) on these sensitivities. Secondly, the connection between PARKAGENT and FEATHERS is established to enhance the capability of data spatial analysis in the model framework. The coupling of the Agent based model with an activity based models is a unique state of art.

Target group

Researchers & Students (interested in Agent based Parking simulation models), Parking experts, Parking organizations, Urban planners, Transport planners, Policy makers, Municipalities, Parking Consultants.

What's new?

In this paper we are trying to enhance the performance of the PARKAGENT model by exploring the impact of the variation in the inputs (key parameters) on the outcomes of the model. On other hand, what is the effect of the demand (cars looking for parking lots) and supply (the parking lots) on these sensitivities. Secondly, the connection between PARKAGENT and FEATHERS is established to enhance the capability of data spatial analysis in the model framework. The coupling of the agent based model with an activity based models is a unique state of art.

Transferability

The Extended PARKAGENT model can be used by other cities and decision-makers to evaluate the parking situation and to explore policy alternatives. Current version of the model is being applied in the city of Antwerp, Belgium. The model has also been applied in the city of Tel Aviv, Bat Yam and Ramat Gan, Israel. in this way the model can also be applied in other cities of the world for better parking management.

Main Outcomes

The main outcome of this research is better spatial analysis of parking situation by forecasting the demand. This will help policy makers and planners to investigate the drawbacks in the parking policies and to develop efficient and fair parking policies.