

6.4.2

A DEVS Framework for GIS Based Urban Transportation Modeling

Presenter

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This presentation describes a DEVS based modeling and simulation framework for developing large-scale urban transportation models. The framework facilitates large-scale agent based modeling by clearly distinguishing between the modeling structures and simulation engine. Agents and environments are described using DEVS atomic and/or coupled models. Changes in the connectivity of agents and environments are modeled with a dynamic structure DEVS network model. This allows agents to move, perceive, and have other dynamic behaviors, and it allows for the creation of dynamic environments. The simulation engine is a high performance implementation of the DEVS simulation procedures, with immediate support for desktop and small-scale parallel computing platforms. The framework is demonstrated with a model that explores how evacuation times for a city sized area is affected by intermediate destinations (e.g., evacuee's stopping to obtain gasoline or other supplies). The evacuation model incorporates LandScan population data for New Orleans, as well as geospatial data that describe the city road network and gasoline station locations within the city of New Orleans.