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CELLULAR AUTOMATON URBAN TRAFFIC MODEL

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Rezumat. *Articolul abordează modelarea traficului urban de automobile. Principalele caracteristici ale metodei expuse sunt utilizarea unui automat celular pentru modelarea distribuţiei autovehiculelor de-a lungul a două străzi între care este interpus un semafor. Se analizează astfel apariţia şi incidenţa fenomenelor de ambuteiaj.*
Modelarea comportamentului conducătorilor auto se face probabilist. Rezultatele prezentate pot fi utilizate atât în vederea asigurării unei fluenţe sporite, cât şi a optimizării consumului de combustibil, controlul nivelelor de poluare chimică şi fonică.

Abstract. *The paper presents an approach for urban vehicle traffic modeling. Main characteristics of the exposed method are the use of a cellular automaton in order to model the vehicle spreading over two streets interconnected with the help of a traffic light. The apparition and the incidence of bottlenecks phenomena are thus analyzed. Drivers' behavior is modeled probabilistically. Obtained results are valuable for increasing traffic fluency, optimizing fuel consumption and controlling chemical and phonic pollution levels.*

Keywords: urban vehicle traffic, cellular automata, intelligent transportation

1. Introduction

Appropriate modeling of urban traffic is of extreme importance in the modern days. Heavily crowded, cities must cope with a growing number of cars, the level of traffic continually increasing. Fluency of vehicle traffic is not the only issue: levels of phonic and chemical pollution are also to be addressed. Fuel consumption is another first-hand issue, especially with the non-renewable, fossil resources showing their limits.

Modeling a city's vehicle traffic is, quite often, a particular and stand-alone problem. This is because, for the vast majority of cases, no networks of roads are the same for any two cities. To further complicate the issue, one has also take into account weight limits, forbidden ways, obligated passages for some categories of vehicles, but also many psychological factors such the driver predilection for large, high-capacity freeways, the attraction exercised by some areas of the city for tourists, seasonal loading of the roads etc.

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