Abstract

In recent years, the rapid growth of road traffic density generates a rising request for tools that can be used to analyze and control the traffic networks. The Microscopic traffic simulation is one of the major tools used in the analysis of traffic systems; it provides a very detailed study of the interaction between the elements of the traffic network. Thus microscopic traffic simulation has become an ever increasing field of research and development. The main aim if this paper is to provide a new model for microscopic traffic simulation; Traditional traffic simulation models neglect some real-life factors that need to be considered, such as the effect of random distribution in the entry of lane. This paper combines the Multi-Agent Systems (MAS) and the stochastic process to model the randomness of vehicles arrival at the entry of the lane. The second contribution of this paper is about the internal structure of mobile agents which initially reacts according to the instructions of the Main agent (MA); in the case of a lack of dynamic information, the mobile agents take decisions based on their experiences accumulated during previous interactions. The obtained results illustrate that using the randomness in the reaction of agent enhanced greatly the performance of simulation.
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References

- B. van Arem, A. P. de Vos and M. J. W. A. “VANDERSCHUREN The microscopic traffic simulation model”. TNO-report INRO-VVG 1997-02b
- José M Vidal “Fundamentals of Multiagent Systems with NetLogo Examples”. March 1, 2010
- Christel Geiss “Stochastic Modeling”. October 21, 2009
- Brian Brewingto, Robert Gray, Katsuhiro Moizumi, David Kotz George Cybenk and Daniela Rus “Mobile agents in distributed information retrieval”. In: Chapter 15, pages 355-395, in Intelligent Information Agents, edited by Matthias Klusch
- Johan Janson Olstam, Andreas Tapani “Comparison of Car-following models”. VTI meddelande 960A • 2004 E-58195 Linköping Sweden
- Madeleine Brettingham “Artificial intelligence”. TES Magazine on 1 February, 2008
- Stan Franklin and Art Graesser Is It an Agent, or Just a Program?: A Taxonomy for Autonomous Agents. Institute of Intelligent Systems, University of Memphis, Memphis, TN 38152, USA
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- Yu, LYue, PTeng, H COMPARATIVE STUDY OF EMME/2 AND QRS II FOR MODELING A SMALL COMMUNITY Transportation Research Record Issue Number: 1858 ISSN: 0361-1981
- Adams w.f. (1936). road traffic considered as a random serie j. instrn. civ. enrgs. ,4,121-13

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