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ACCEPTED MANUSCRIPT

CELLULAR AUTOMATA MODEL FOR TRAFFIC FLOW AT INTERSECTIONS IN INTERNET OF VEHICLES

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Considering the effect of the front vehicle's speed, the influence of the brake light and the conflict of the traffic flow, we established a cellular automata model called CE-NS for traffic flow at the intersection in the non-vehicle networking environment. According to the information interaction of Internet of Vehicles(IoV), introducing parameters describing the congestion and the accurate speed of the front vehicle into the CE-NS model, we improved the rules of acceleration, deceleration and conflict, and finally established a cellular automata model for traffic flow at intersections of IoV. The relationship between traffic parameters such as vehicle speed, flow and average travel time is obtained by numerical simulation of two models. Based on this, we compared the traffic situation of the non-vehicle networking environment with conditions of IoV environment, and analyzed the influence of the different degree of IoV on the traffic flow. The results show that the traffic speed is increased, the travel time is reduced, the flux of intersections is increased and the traffic flow is more smoothly under IoV environment. After the vehicle which achieves IoV reaches a certain proportion, the operation effect of the traffic flow begins to improve obviously.

Keywords: traffic flow, cellular automaton, IoV, intersection

1. Introduction

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