

Abstract

Since someone brought up that the traffic flow is similar as fluid flow, we think the motion of the motorcycles feels like the fish swimming in the water and the way of the drivers collecting informations by using vision also is similar to fish. Therefore we found out a research about the motion of the fish, an article about the movement pattern in the view of angle of deviation in that research conforms to the concept of this research. So we will develop a set of motion of motorcycle based on the concept of the fish motion model.

In this study, the motion of the motorcycle is divided into the longitudinal moving and the traversal moving according to the angle of deviation. When the longitudinal moving and the traversal moving approach with the original data, it means the angle of deviation is closer to the original data, in the performance of traversal moving in this research, above six tenths achieved the acceptable scope (the erroneous scope is in 0.2 meter), above eight point five tenths achieved 0.4 meter in erroneous scope, but at the longitudinal moving part, there is above six tenths in the erroneous scopes of 0.005 meter, and above eight tenths in the erroneous scope of 0.01 meter. In the final part of the research, we apply the model to forecast the motion trajectory of the motorcycle and to seek the shortest distance of overtaking. The former can have an effect in the reasonable range. There are two situations at the aspect of the shortest distance of overtaking, one's the shortest distance of overtaking with a relative velocity of 10 km/hr, the shortest safe overtaking distance in longitude of the vertical is 5m, the distance of the horizontality is 0.6m, is equal to the relative distance of 5.04 meters, and the angle of deviation is -0.8275. When the relative velocity is 20 km/hr, the distance of the vertical is 3m, the distance of the horizontal is 0.4m, is equal to the relative distance of 3.03 meters, and the angle of deviation is -0.9862.

This research used reference points and center of gravity these two concepts of fish motion model to construct the motion of motorcycle, to prove the model in this study is feasible after parameter calibration, model verification and model validation.

Keyword: Motorcycles, Angle of deviation