Travel-Time Estimation By Cubic Hermite Curve

ABSTRACT

Travel time is a measure of time taken to travel from one place to another. Global Positioning System (GPS) navigation applications such as Waze and Google Maps are easily accessible presently and allow users to plan a route based on travel time from one place to another. However, these applications can only estimate general travel time based on a vehicle's total distance and average safe speed without considering route curvature. A parametric cubic curve has shown a potential result in travel-time estimation through geometric properties. In this paper, travel time has been estimated using the curvature value obtained from the Hermite Interpolation curve fitted to each section of the selected road. Design speed is determined from the curvature value, and thus an algorithm for travel-time estimation incorporating initial driving information is developed. The proposed method's accuracy was compared to the existing method's accuracy using a real-life driving test. This comparison demonstrated that the proposed method estimates travel time more accurately than Google Maps and Waze. Future study can further improve the estimation by embedding traffic data into the algorithm.