Traffic Big-data Analysis with Google Maps Spatio-temporal Database : Atlanta, Georgia, 2021

Virtual Paper Abstract

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Abstract

As traffic data collection and processing methods have evolved, various traffic congestion related studies like traffic volume prediction have been conducted. However, in most cities, problems such as increased travel time, wasted resources, and increased air pollution are still caused by traffic congestion. In this study, by focusing on the characteristics of the periodicity of traffic congestion, we present the research results applied to urban congestion by extracting daily traffic congestion patterns in Atlanta, Georgia. Traffic congestion database(TCD) was constructed by extracting traffic congestion information from Google Map traffic information images in the form of Real Time Map (RTM) based on FCD (Floating car data). First, using this, the characteristics of congestion by day of the week and the characteristics of congestion at major congestion points were studied. The characteristics of urban traffic congestion showing periodicity according to time factors such as day of the week, morning and afternoon, weekdays and weekends were confirmed. Therefore, the K-means clustering method was used to extract patterns according to the change in congestion level during the day. And pattern-based congestion map was produced that provides intuitive spatio-temporal information about urban congestion based on the six extracted congestion patterns. The data acquisition and 3D formal structure database construction method presented in this study will be applicable to various studies requiring traffic congestion information. In addition, this study is expected to be valuable as a tool for making traffic policy decisions in other cities by suggesting the characteristics of traffic congestion based on congestion patterns.

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