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Integration of Big Data to Predict Transportation for Smart Cities

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Abstract : The Intelligent transportation system is essential to build smarter cities. Machine learning based transportation prediction could be highly promising approach by delivering invisible aspect visible. In this context, this research aims to make a prototype model that predicts transportation network by using big data and machine learning technology. In detail, among urban transportation systems this research chooses bus system. The research problem that existing headway model cannot response dynamic transportation conditions. Thus, bus delay problem is often occurred. To overcome this problem, a prediction model is presented to fine patterns of bus delay by using a machine learning implementing the following data sets; traffics, weathers, and bus statues. This research presents a flexible headway model to predict bus delay and analyze the result. The prototyping model is composed by real-time data of buses. The data are gathered through public data portals and real time Application Program Interface (API) by the government. These data are fundamental resources to organize interval pattern models of bus operations as traffic environment factors (road speeds, station conditions, weathers, and bus information of operating in real-time). The prototyping model is designed by the machine learning tool (RapidMiner Studio) and conducted tests for bus delays prediction. This research presents experiments to increase prediction accuracy for bus headway by analyzing the urban big data. The big data analysis is important to predict the future and to find correlations by processing huge amount of data. Therefore, based on the analysis method, this research represents an effective use of the machine learning and urban big data to understand urban dynamics.

Keywords : big data, machine learning, smart city, social cost, transportation network
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