



Bus speed estimation by neural networks to improve the automatic fleet management

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Abstract

In the urban areas, public transport service interacts with the private mobility. Moreover, on each link of the urban public transport network, the bus speed is affected by a high variability over time. It depends on the congestion level and the presence of bus way or no. The scheduling reliability of the public transport service is crucial to increase attractiveness against private car use. A comparison between a Radial Basis Function network (RBF) and Multi layer Perceptron (MLP) was carried out to estimate the average speed, analysing the dynamic bus location data achieved by an AVMS (Automatic Vehicle Monitoring System). Collected data concern bus location, geometrical parameters and traffic conditions. Public Transport Company of Palermo provided these data.

Keywords: Radial Basis Neural Network; Public Transport Performances; AVM system.

1. Introduction

Liberalization and privatisation of the public transport impose the adoption of appropriate strategies to improve the efficiency and the competition. The rationalization of the resources and the competition among different sectors (costs reduction, waste elimination, profits increase, improvements of the perceived service quality) have required the use of telematics and control systems for the automatic fleet management. Furthermore, an improved service quality of the public transport can attract new users. Under this aspect: by the company's view point, it produces an increase of revenue; whereas by the citizens' view point, it implies a reduction of the travel time and delay; whose effects can be led up to an increase the life quality, de-congestioning urban areas, and reduction of noise and air pollution levels.

The recent advances in information and communication technologies, which support phases of collection, storage, processing and dissemination of information, allow to have spatially referenced data. Intelligent Transport Systems (ITS) defined as: *the*

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