Vehicular Networks to Intelligent Transportation Systems

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Abstract Urban mobility is a current problem of modern society and large cities, which leads to economic and time losses, high fuel consumption, and high CO_2 emission. Some studies point out Intelligent Transportation Systems (ITS) as a solution to this problem. Hence, Vehicular Ad hoc Networks (VANETs) emerge as a component of ITS that provides cooperative communication among vehicles and the necessary infrastructure to improve the flow of vehicles in large cities. The primary goal of this chapter is to discuss ITS, present an overview of the area, its challenges, and opportunities. This chapter will introduce the main concepts involved in the ITS architecture, the role of vehicular networks to promote communication, and its integration with other computer networks. We will also show applications that leverage the existence of ITS, as well as challenges and opportunities related to VANETs such as data collection and fusion, characterization, prediction, security, and privacy.

1 Introduction

The disorderly growth of large urban centers has caused severe socioeconomic and structural problems for the population, which contributes to the increase of social inequalities and a significant stress on the structure of cities. In this way, services

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