Chapter 2
A Survey on Autonomous Vehicles in the Field of Intelligent Transport System

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Abstract With the advancement of intelligent vehicles, people are gaining interest in the field of Intelligent Transport System (ITS). ITS plays a vital role in the development of smart cities that are being developed with higher accuracy. Autonomous vehicle technology is projected to improvise travel costs and congestion, decrease road incidents, and also alleviate climate change. Autonomous vehicles would need close human–computer interacting skills to recognize these advantages. However little progress has been made in contact between humans and automated vehicles in road traffic scenarios. This paper focuses on analyzing vehicle drivers and pedestrians while using electronic gadgets on roads. Moreover, it also discusses various collision prevention approaches used in the field of ITS.

Keywords Intelligent transport system · Autonomous vehicles · Collision prevention · Pedestrians · Electronic gadgets

1 Introduction

In huge traffic scenes, it is very difficult to make communication possible between various pedestrians and vehicle drivers. The reason behind the miscommunication is the absence of authorized signals and mostly the available signals are unclear. Moreover, the change in communication may take place due to the change in traffic location, e.g., country or city. There is a greater possibility of traffic conflicts due to miscommunication or lack of communication between road users. Several techniques are used by road users, namely, pedestrians and drivers for establishing communication with each other. Pedestrians make eye contact which may include glancing or staring, waving hands, head nod, whereas drivers make eye contact, flashlights, or waving hands. In the case of autonomous vehicle driving (i.e., in the absence of driver) [1], LED lights [2] or displays on the vehicle are used for communication. Various hand gestures of pedestrians and vehicle drivers have been shown in Fig. 1a, b, respectively.

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