Chapter 1
Leveraging Machine Learning and Artificial Intelligence for Enhanced Connectivity in Vehicles:
Intelligent Transportation Systems

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ABSTRACT

Machine Leanring (ML) and Artificial Intelligence (AI) can change the game of transport with Intelligent Transportation Systems (ITS). The connected graphs observe architecture and enable from the ML and AI across domains to change the performing method of connectivity and make available better traffic performance, security enhancement, and mobility optimization. The big data from sensors, vehicles, and infrastructure are processed by machine learning algorithms to provide data-driven, real-time decisions, predictive analysis, and traffic flow optimization for smooth flow, less jam, and fewer emissions. Resulting in the smart cities intelligent mobility, with the rise of AI and ML in ITS, the smart motors are being transformed into adaptive devices that can change as per evolving traffic scenarios. It explores how AI and ML may be integrated with smart cities and ITS to make these connected, efficient, and sustainable and examines current and emerging applications of ITS with a future outlook.

INTRODUCTION

Transportation systems are one of those areas that are also passing through a new stage of evolution induced by technology, mainly the adoption of machine learning and artificial intelligence in the so-called Intelligent Transportation Systems (ITS). A deeper evaluation of these technologies for solutions of more effective, safe, and sustainable traffic paradigms. ITS stands for Intelligent Transport Technologies, which are the modern telecommunications networks, sensor devices, data analytics, and artificial intelligence technologies that have recently optimized transport infrastructure and mobile-based advancements. In fact, they are constantly evaluating the real-time state of the roadways, using multi-terabyte data to make immediate and autonomous decisions en route for optimal traffic flow and congestion mitigation while also predicting potential crashes(Dash et al., 2018).

ML is the part of the AI that deals with the capacity of the system to understand from the data and further enhance its accuracy. For ITS, ML algorithms will combine historical data and real-time feeds from a wide range of sources—from traffic cameras to roadway surface sensors to vehicle GPS logs to social media." Once data is collected, it is then analyzed by ML (machine learning) algorithms to recognize patterns and to predict future occurrences and even decisions about traffic flow, accident probability zones, and time taken to reach a particular destination. Based on historical data, for example, ML is used to predict heavy traffic conditions in a sensitive area, so the system can make changes to, for example, traffic lights or

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