Integrating Internet of Things and AI for Advanced Urban Traffic Management Systems

Mihika Sanawar[*], Naina Sharma

Amity International Business School, Amity University, Noida, India

Email address:

mihika.sanawar1@s.amity.edu (Mihika Sanawar), naina.sharma8@s.amity.edu (Naina Sharma)

[*]Corresponding author

Abstract

As urban areas continue to grow, effective traffic management becomes increasingly crucial to ensure the smooth flow of vehicles and reduce congestion. This paper explores the integration of Internet of Things (IoT) devices and Artificial Intelligence (AI) techniques to create an advanced urban traffic management system. The objective is to leverage real-time data from IoT sensors deployed across the city to dynamically manage traffic signals, reduce congestion, and enhance overall transportation efficiency. The methodology involves deploying a network of IoT sensors to collect data on traffic density, vehicle speed, and environmental conditions. AI algorithms, including machine learning and deep learning models, are then used to analyze this data and predict traffic patterns. The results show a significant reduction in traffic congestion and travel times, with optimized signal timings and route recommendations. Case studies from major metropolitan areas illustrate the practical applications and benefits of this approach. The conclusion underscores the potential of IoT and AI in revolutionizing urban traffic management, calling for further research into more sophisticated algorithms and wider sensor networks.

Keywords

Internet of Things, Artificial Intelligence, Traffic Management, Urban Planning, Smart Cities, Machine Learning, Deep Learning, Real-Time Data