Intelligent Parking Management Systems Using IoT and Machine Learning Techniques for Real-Time Space Availability Estimation

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Abstract:
Traffic jams and drivers looking for parking spaces are caused by the increased urbanization and vehicle population. This paper proposes an intelligent parking guidance system that effectively manages spots for parking by using the Internet of Things (IoT) and Machine learning methods. The system uses IoT sensors and cameras positioned in parking lots to track the occupancy status of specific parking spots in real-time. The acquired data is sent to a cloud server for analysis and processing. The Convolutional Neural Network (CNN) algorithm, a deep learning approach, is used to evaluate the camera images and accurately determine if parking spots are occupied. The number of parking spots available, location directions, and expected arrival times may all be accessed by drivers using a user-friendly smartphone application. Advanced features such as requests, payment, and navigation integration may also be added to the system to improve the parking experience.

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Contents

Modern society is multiplying, and individuals are buying vehicles for convenience. Due to rising vehicle density, users need help obtaining parking during peak hours [1]. This framework will construct an intelligent parking system using IoT innovation and mobile apps. A mobile app is being created to monitor parking space availability through mobile devices. A smart parking system in metropolitan centers may minimize fuel use and pollution, which are possible issues. The vehicles in parking slots use a Support Vector Machine (SVM) classifier and a CNN-trained image classifier discussed in [2]. Deep CNN characteristics from Public datasets were utilized for training and evaluating classifiers. The detection accuracy for the public dataset and accuracy for the dataset indicate that the technique is effective for outside problems. Car drivers wander the city looking for a parking spot, wasting fuel and polluting. To alleviate the issue, a mobile app is suggested to reserve parking lots in advance for pre-planned trips. A two-way screening method permits vehicles to prevent stolen cars from parking in parking lots. The device also lets users choose their parking spot [3].

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