Problem Statement

In many shopping complexes, drivers face significant difficulties when searching for available parking spaces. After parking, they often struggle to remember the exact location of their vehicle, especially in large or multi-level parking areas. This situation leads to frustration, congestion, time wastage, and poor overall user experience. Shoppers, visitors, and parking lot operators are particularly affected during peak hours such as weekends and holidays, when parking demand is at its highest.

According to Karunarathna and Rathnayake "**People in Sri Lankan shopping malls spend a lot of time searching for car parking slots inside the parking areas. As access control and payment handling for parking are controlled manually, results in customers wasting a considerable amount of time.**" (Karunarathna and Rathnayake, 2023, pp. 999–1000) This highlights the ongoing inefficiencies in Sri Lankan shopping mall parking systems.

The root cause of this problem is that most parking facilities lack real-time updates, slot reservation options, and clear guidance systems. Drivers have no accurate information on which areas are available or occupied, leading to random and inefficient circulation within the parking complex. Additionally, the absence of vehicle location assistance makes it difficult for users to find their parked vehicles, further contributing to delays and dissatisfaction.

Solution

To address the challenges faced by drivers in locating available parking spaces and finding their parked vehicles, a **Smart Parking System** can be introduced. This system will utilize sensors and digital technologies to provide real-time information about parking slot availability. Drivers will be able to view vacant slots through a mobile application or display screen before entering the parking area, reducing time spent searching for spaces and minimizing congestion.

The system will also include a vehicle location tracking feature, enabling users to easily identify the exact spot where their vehicle is parked. This can be achieved through QR codes, GPS tagging, or a mobile app interface that records the vehicle's location upon parking. Additionally, the system can support features such as slot pre-reservation, and digital payment options.

By integrating these technologies, the Smart Parking System aims to improve parking efficiency, reduce driver frustration, and enhance the overall parking experience for shoppers, visitors, and management staff alike.

Reference

Karunarathna, S. and Rathnayake, U., 2023. Suitability of smart car parking for shopping malls in Sri Lanka. In: Y.G. Sandanayake, K.G.A.S. Waidyasekara, T. Ramachandra and K.A.T.O. Ranadewa, eds. Proceedings of the 11th World Construction Symposium, 21–22 July 2023, Sri Lanka. Colombo: Ceylon Institute of Builders, pp. 998–1010. Available at: https://doi.org/10.31705/WCS.2023.80 [Accessed 18 Oct. 2025].