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DEVELOPMENT OF AN AUTOMATED PARKING SYSTEM FOR PERSONAL VEHICLES

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The modern rhythm of life in megacities and large cities requires new solutions for efficient use of space. One of the main problems is the lack of parking spaces. Traditional parking lots occupy significant areas, their construction is often associated with high costs and difficulties in operation. The solution to this problem is automated parking systems, which not only optimize the use of territory, but also significantly simplify the parking process. Automatic parking systems are high-tech complexes that maximize the use of limited space for parking vehicles. Such systems replace traditional parking spaces, providing a convenient, safe and cost-effective way to place personal vehicles.

Automatic parking lots are innovative designs that combine mechanical and digital technologies. They operate without human intervention, thus eliminating the human factor, minimizing the probability of parking errors and ensuring maximum safety for cars. Such systems are widely used in residential and commercial buildings, public spaces and transportation infrastructure. In modern automatic parking systems, various data transfer protocols and standard interfaces are used for interaction between hardware (sensors, controllers, barriers) and software (servers, operator workstations, cloud services). The controller sends aggregated data about its state to the control device and receives commands to perform certain actions stipulated by the parking algorithm. The main parking control device collects, visualizes, archives and processes data, and provides access to information via specialized software or web interface. In the process of software development, the user interface, ways of interaction with the parking control device were developed.

The basic principle of automatic parking systems is to automatically move the car to a free parking space using mechanical platforms or elevators. This greatly simplifies the parking process for drivers and reduces the burden on infrastructure.

Advantages of the developed automatic parking system:

– space saving: increased capacity by 300 %...500 % due to compact placement;

– security: vehicles are protected from theft and damage due to closed storage areas;

– cost reduction: minimize manual labor and optimize rates;

– user-friendly system: instant search for locations and cashless payment.

Thus, the introduction of automated parking systems is an actual and demanded solution to optimize the use of urban space, improve the comfort and safety of car owners, as well as reduce economic and environmental costs associated with parking.