

Hypermicron Smart Parking

SMART PARKING MANAGEMENT SOLUTION



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SMARTPARKING

SmartParking is an advanced parking management system specifically designed for very large and complex car parks with high vehicle traffic. The system integrates modern technology, aiming to build a "green" solution that contributes to environmental protection and enhances the parking experience for users.



Optimized Operations Management

Provides a modern parking management system to optimize slot utilization and improve operational efficiency for large airports.



Towards a Green Environment

Supports and encourages the use of eco-friendly solutions, reducing pollution through smart management and green utilities integration.



Enhanced Customer Experience

Builds a comprehensive ecosystem of services for parkers, including reservations, cashless payments, and security assistance.



Technological Innovation

Continuously updates advanced technologies to ensure system stability, security, and seamless integration with airport-related systems.

Solution Overview

Parking Guidance



Car Locating



Entrance & Exit



Parking Management



KEY FEATURES



Smart Parking Slot Search & Reservation

- Easy parking slot search: Real-time updates on available slots.
- Remote booking via App/Web: Users can conveniently reserve Parking slots in advance.
- Guided parking assistance: Drivers are directed from the entrance to the nearest available slot using signal lights, directional arrows, and a mobile app.



Optimize slot & automate vehicle coordination

- Real-time AI camera system for license plate recognition and automated vehicle verification.
- Automated vehicle dispatching & parking arrangement based on vehicle type and designated zones.
- Accurate real-time display of available parking slots.
- Fixed slot reservation management for monthly tenants.
- Integration with smart ride-hailing systems to assist in vehicle coordination.



AI-based Parking Surveillance & Security

- Real-time parking monitoring, displaying a complete parking model on the software.
- Video/image review for incident investigation, ensuring quick resolution.
- Abnormal behavior detection, issuing alerts for fights, vandalism, or suspicious object disposal.
- Detection of wrong-way driving, illegal parking, and smoke/fire alarms.



Modern Payment System

- Supports multiple electronic payment methods with integration of advanced payment gateways.
- Prepaid payment support via App/Web and toll stations, reducing exit delays.



Comprehensive Reporting & Analytics

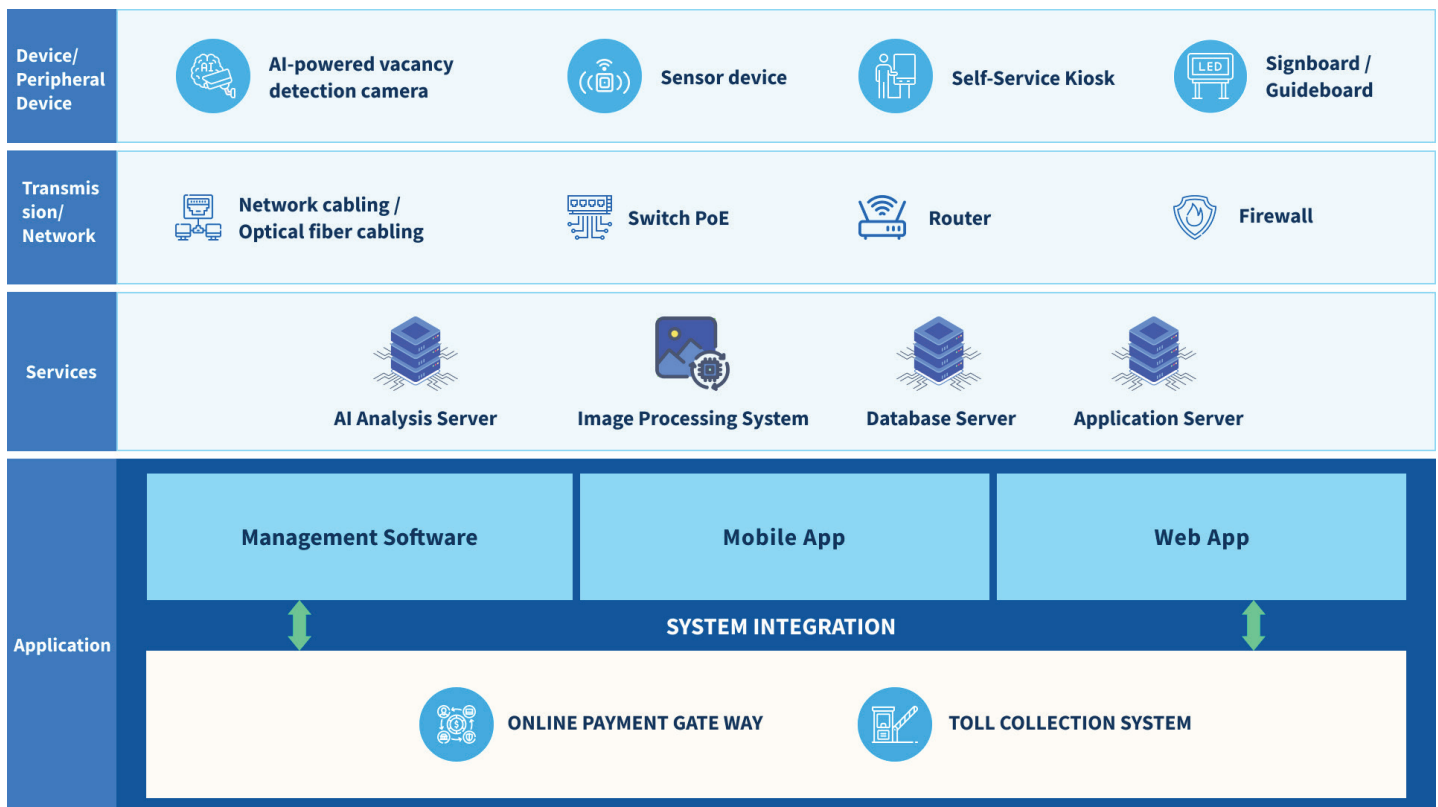
- Tracks vehicle entry/exit statistics, empty slot usage, average parking duration, revenue, and incidents.
- Real-time automated reports, with Excel/PDF export support.
- Enhances revenue monitoring and loss prevention through integrated parking duration tracking.



User-Friendly Interface

- Intuitive, simple design for easy operation by staff and customers.
- Multi-platform support: Accessible via computers, mobile apps, and touch-screen kiosks.
- Automated reporting by hour/day/month, with export options in Excel/PDF.
- Automatic recognition of parking duration, enabling fee reconciliation to prevent revenue loss.

System Overview



Our vision is to establish an advanced, eco-friendly parking management solution, transforming every airport into a smart, safe, and environmentally friendly operation slot - where technology and convenience come together to provide an exceptional parking experience.



Seamless Automatic Barrier Control

Vehicles are monitored via license plate recognition cameras, eliminating the need for tickets, ensuring smooth and uninterrupted traffic flow.

License Plate Recognition Cameras

- Captures and identifies vehicle license plates.
- Supports video/sensor-based detection to trigger automatic barrier opening.



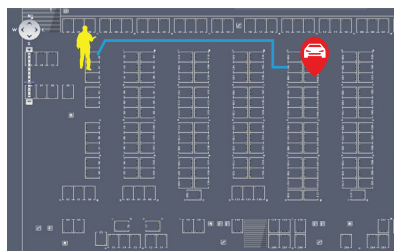
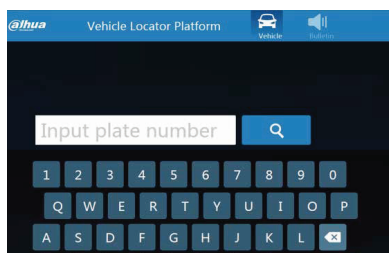


The guidance system helps drivers find Parking slots quickly and optimizes Parking slot utilization using LED signals, directional signs, and a mobile app.

- Easy parking slot search: Automatically detects and displays available slots.
- Optimized slot utilization: Smart allocation and tiered parking distribution.
- Visual guidance: Navigation from the entrance to the designated slot via mobile app or LED panels.

Smart Vehicle Locator

Touchscreen kiosk system to help users locate their vehicle by searching the license plate, confirming vehicle images, and displaying the parking location. Guided navigation from the kiosk to the parked vehicle.



Professional Management Platform



- User-friendly interface: Simple, intuitive design for easy operation.
- Card & device management: Supports monitoring of security cameras, kiosks, LED panels, firmware updates, and remote control.
- Real-time empty slot management: Enables staff to monitor and adjust parking assignments flexibly, including fixed slots (monthly rentals).
- Video/image review capability for incident handling.
- Reserved parking protection: Prioritized zones for internal vehicles, electric vehicles, disabled parking, VIP sections.



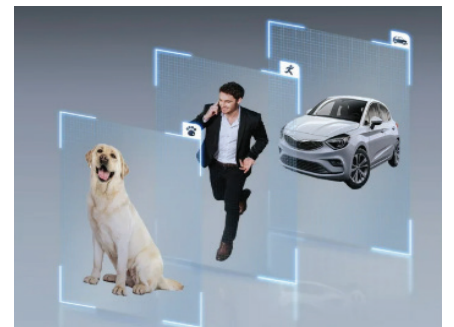
Integration with the CCTV system to alert the following behaviors:



Detect vehicles moving in the wrong direction.



Detect human behaviors such as fighting or vandalism.



Identify and classify different objects, including people, vehicles, and animals.



Detect and recognize unattended objects left intentionally or unintentionally for a certain period, posing a security threat in the parking area.



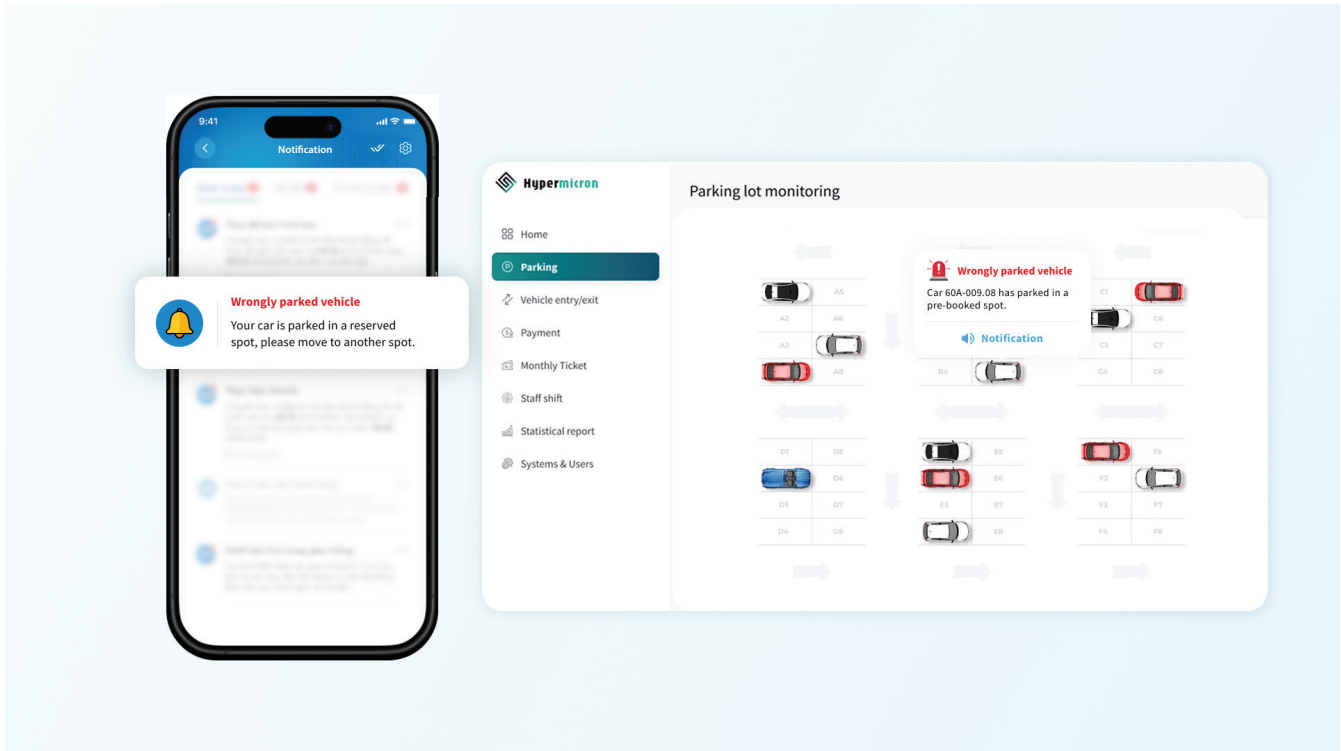
Detect and alert for fire hazards.



Warning for improper parking in restricted areas, such as employee-only zones, wheelchair-accessible spaces, priority parking spots, and electric vehicle charging stations

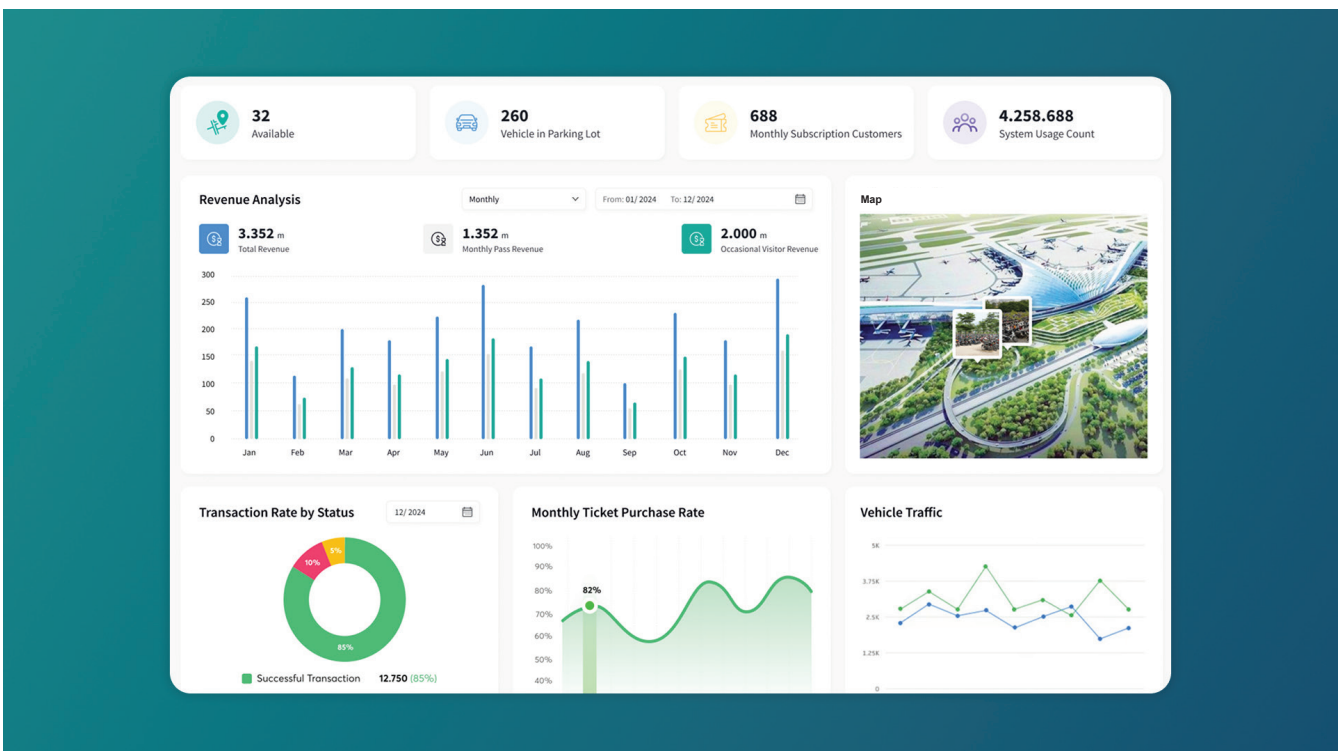
Surveillance & Alerts

- Comprehensive monitoring: Real-time tracking of the entire parking area, updating available slots dynamically.
- Illegal parking alerts: Detects and notifies staff of violations, with image/video capture for records.
- Vehicle statistics & tracking: Simplifies monitoring of the number and location of parked vehicles.



Advanced Data Analytics & Reporting

- Operational performance tracking, revenue analysis, and usage trends.
- Detailed reports: Automated compilation of daily/weekly/monthly/ yearly data on vehicle movement, revenue, and incidents.
- Predictive analytics: Tracks average parking duration, identifies usage patterns for optimization.

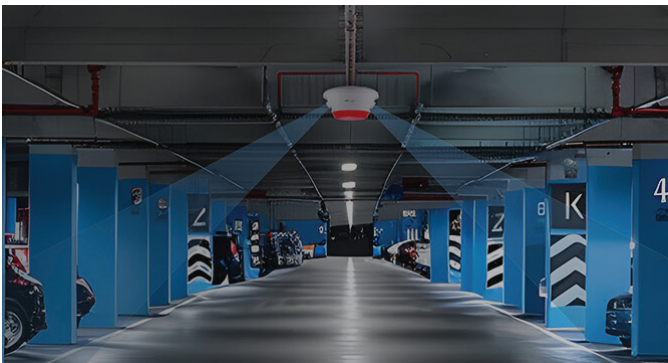


CORE TECHNOLOGIES

Entrance & Exit with APRN



- Fast and accurate ALPR cameras ensuring smooth operation.
- Resilient even during network outages, maintaining recognition functionality.

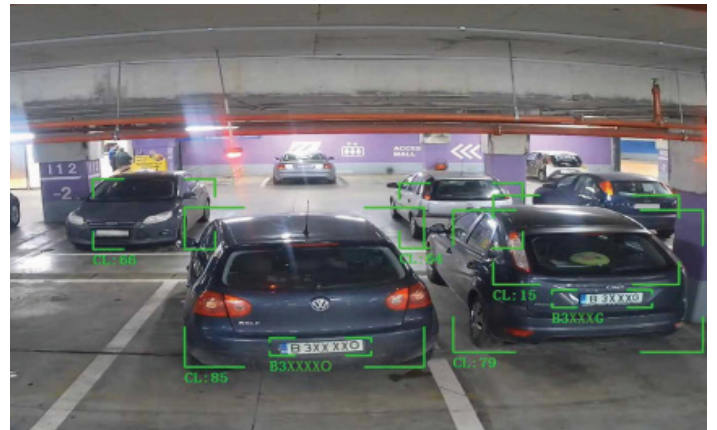


Real-Time Parking Slot Detection

- Manage multiple slots per camera (depends on camera's view)
- Provides precise location information for vehicle identification.

Deep Learning-Based Vehicle Shape Recognition

Utilizes advanced deep learning algorithms to recognize vehicles even when license plates are obstructed by snow, mud, etc.



Smart Parking Management Platform

- Designed specifically for airport parking operations.
- Intuitive interface with integrated navigation maps.
- Supports VIP and internal parking reservations.
- Comprehensive data analysis to assist operators in optimizing parking utilization.
- Easily expandable and integrable with other airport systems.
- Enhances management efficiency while reducing labor costs.

SYSTEM ARCHITECTURE

Indoor

1 License Plate Recognition Camera

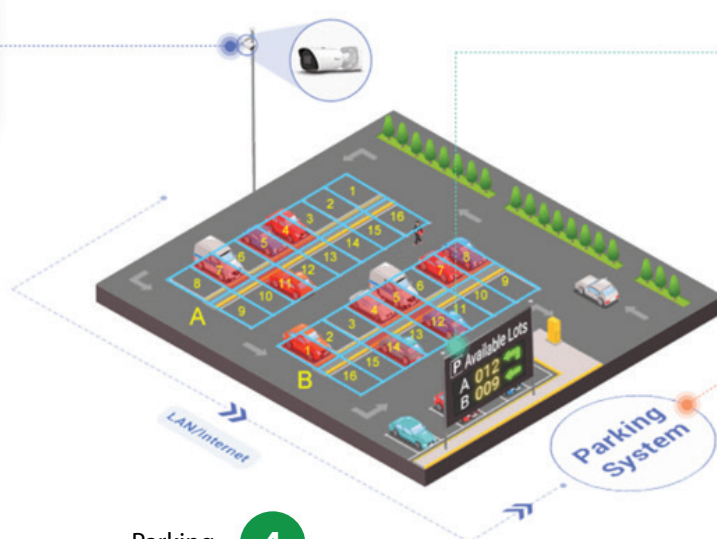
2 Camera Dual Lens



Outdoor

1 Camera AI Outdoor

Electronic Signage 2



3

Central operating system

Parking 4



Scalability & Integration

Modular Design: Easily add new lanes or gates by installing additional devices and configuring the software.

Integration with Airport Systems: Connect to CCTV, central payment systems, and open APIs for real-time data sharing (reports, revenue, etc.).



Security & Data Protection

Data Privacy: Store images and videos on the airport's internal server; assign user access rights based on roles.

Secure Connections: Cameras and card readers communicate via HTTPS; all actions are logged for auditing.

Failover Architecture: Automatically switches to a backup server if a failure occurs, ensuring 24/7 uptime.

Anomaly Alerts: Instantly notifies staff of fake cards or mismatched license plates, enabling rapid security response.

BENEFITS & VALUE PROPOSITION

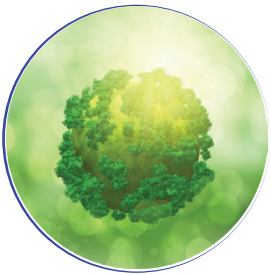
Enhanced Management

- Reduces the time spent searching for Parking slots and optimizes
- Effectively manages vehicle flow, minimizes congestion, and improves operational efficiency.



Environmental Protection

- Supports the development of green solutions, reducing emissions and pollution.
- Integrates eco-friendly features to promote sustainable operations



Improved Customer Experience

- Minimizes wait times and enhances customer service.
- Enables fast, secure, and convenient payments through modern technology.



Cost Savings

Lowers operational and maintenance costs through automation and remote management.



Enhanced Security

A smart camera monitoring and early warning system helps reduce risks and ensures asset safety.

