Autonomous Mobile Parking Robot

Autonomous Mobile Parking Robot is a robotic and control technology that moves vehicles to designated parking spaces, optimizing parking efficiency and enhancing driver convenience.

This system reduces parking time by automating vehicle movement and space search, while also eliminating vehicle-human collisions in parking lots, thus maximizing parking space efficiency.



▲ An autonomous parking robot moves a vehicle into a parking space.

Issues to Tackle

- Minimizing parking time and movement within office buildings by reducing search time for available spaces.
- Eliminating close-contact risks between pedestrians and vehicles, as well as between vehicles inside parking lots.

Expected Benefits

- Maximizes parking efficiency by utilizing building passageways for parking.
 - * Parking efficiency increases by 30% as passages can be used for parking, eliminating the need for driver exits.
- □ Reduces parking infrastructure costs
 - * Cuts initial installation costs by 20% as it removes the need for rails, lifts, and other equipment required in mechanical parking systems

Key Services

- \cdot When a driver exits the vehicle at a parking entrance, the parking robot automatically detects the license plate and moves the car to an empty space.
- \cdot At exits, the driver inputs the vehicle number into the system, and the parking robot autonomously retrieves the car.
- · Automated re-parking service to manage vehicle entry and exit within the parking lot.
- · API integration with parking control and management systems for seamless operation.

Use Cases

- · Bucheon, Gyeonggi Province (2020–2023): Smart parking operations using the 'NarCar' parking robot in underground parking lots for three years.
- · Bupyeong, Incheon (2024): Golf-themed commercial district implementing 35 parking robots for public parking, with plans for expansion to reduce wait times.
- Hyundai WIA: Hyundai WIA commercialized parking robots at the Hyundai Motor Group Innovation Center in Singapore (HMGICS) in 2023 and at 'Factorial Seongsu' in 2024.

Key Components



Configuration

Autonomous Parking Robot Platform



Size **Driving Speed**

Length: 1890mm, Width: 1142mm, Height: 110mm 1.2m/s

Control Capacity Simultaneous control of up to 50 parking robots



Parking Robot Entering Under the Vehicle to Lift It

Key Technologies

1. Level-4 Autonomous Driving

· The robot autonomously recognizes obstacles, empty spaces, and driveways, adjusting wheel angles and balance to lift and move vehicles.

2. LiDAR

· Uses laser emissions and reflections to identify road shapes and surrounding obstacles.

3. Sensor

· Detects the surrounding environment and determines the optimal route.

4. Parking Robot Multi-Control Technology

· Uses QR codes on the parking lot floor to precisely locate vehicles and simultaneously control up to 50 parking robots.

4. API Integration

· Seamless integration with various parking facility systems, allowing scalability and interoperability.

Parking Robot Charging Station

The parking robot continuously monitors its charging status in real time. When the battery reaches a preset threshold, the robot autonomously moves to the charging station and initiates charging.

Stand by for charging





Technology Companies

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