SMART PARKING MANAGEMENT SYSTEM

Proposed By
CYBERCINATICS PRIVATE LIMITED
About Cybercinematics

- Startup recognized by Department of Industrial Promotion and Policy - “Startup India”
- Member of IT Association of Andhra Pradesh (ITAAP)
- Located in Visakhapatnam, Andhra Pradesh

**Working Areas:**

- Smart Cities
- Internet of Things (IoT)
- Industrial automation
- System Integration
- Image analysis and processing systems
- Android and iOS applications
Smart Parking Management System

- Proposing a Customized Automated Vehicle Parking System.
- Suitable for On street, Off street and Multi-level parking Lots.
- Public can know the availability of parking vacancies in Real-time through mobile application.
- Governance bodies can monitor the system from their Remote command and Control center.
- Parking fees will be charged as per parking time.
- Surveillance to provide security.
- Recognize violation and charge them with penalty.
- Entire System is according to the new parking guidelines for smart cities.
- Readily Deployable System.
System Architecture

Architecture of Smart Parking System
System Architecture

Architecture of On-Street Parking System
Smart Parking Zone Features

- Access the real time occupancy of individual parking Lots.
- Real time location based view to citizens about availability of parking space.
- one-to-one mapping with parking sensors
- Captures & Stores the number plate images of vehicles entering and exiting parking lot.
- Generation of parking receipts at the parking Lot.
- Hardware failure can be reported & tracked through portal
- Various reports like payment status, check-in vehicle list, check-out vehicle list, hardware active status, payment pending list etc.,
- Provision for Manual Entry incase the cameras do not recognize the vehicle.
- Surveillance cameras at the Parking lots provide secured monitoring.
Parking Zone Status Displays

- Parking Zone should be allocated either On-street or Off-street.
- The parking zone is identified by Sign boards.
- The On-Street Parking Zone will have no obstructions on road.
- LED Signboards will be installed at the entry point of the parking Zone.
- Real time vacancy availability will be displayed on LED Signboards at the entry.
Vehicle Occupancy Detector

- Vehicle Occupancy Detectors installed on the ground; one number each for a parking slot.
- The Vehicle Detector is battery operated and will continuously sense the presence of vehicle in the slot and sends the data to the receiver wirelessly.
Vehicle Occupancy Data Receiver

- The receiver (works in 865Mhz to 867Mhz ISM Band) updates this Occupancy data to the server in control center through the internet using wired Network.
ANPR Camera

- Automatic Triggering & Detection of Vehicles.
- In-Built Recognition software.
- HD 1280X720.
- Day/Night Modes.
Parking Management Software

Parking software with the Parking Zone details, Zone status, Payment status etc.
Parking Vacancy & Payment Status

Displays the Individual Parking Zone details and also the parking vacancy in the zone.

Displays the parking zone details like total entered cars of the day, total cars paid, payment pending cars and also we can get the single payment details of particular vehicle through the unique ID.
Vehicle Check-In into Parking Lot

Auto-generated vehicle number through the ANPR Entry camera to be confirmed by the operator

Check-In cars List in the Parking Software.
Vehicle Check-Out from Parking Lot

Vehicles will be added to Payment Pending list once the vehicle leaves the Parking Zone. Payment mode can be cash or mobile to be selected by the operator. Automatically cleared from list once payment is done.

Auto-generated vehicle number through the ANPR camera at the exit of the parking zone
Management panel for User Management, Manual check-in & check-out entries, payment reports etc.,
Vehicle Parking Challan Generation

Generated Challan for a Payment Pending vehicle
Software Users Management

Software users management i.e. Admin & Operators

Registration Page for software users
Manual Check-In & Check-Out

Manual check-in of vehicle entering into the parking Zone

Manual check-out of vehicle leaving from the parking Zone
### Vehicles Transaction History

#### History Details From '27-02-2012 12:24:43' To '27-02-2018 12:24:43'

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History of all vehicles used the Parking Zone.
Sensor details at Parking lot

Installed Sensor details monitored through the Parking Software

List of sensors not working, list generated based on real-time information
Report Generation through Software

Generated Excel reports of pending payments, history of payments
Surveillance

- There will be surveillance cameras (Visible & Infrared based) with Zoom Capability situated at entry and exit points to monitor the parking zone.
- Any unauthorized vehicle entry which is not going through the Number Plate Recognition can be easily verified by the Operator through the Surveillance Monitor.
- Surveillance video is separately stored in NAS Storage, and can be accessed remotely.
Mobile Application

- Public (Users) can check the availability of the parking zone through Mobile App installed in their mobiles.
- Mobile App also shows the real-time occupancy of the Parking Zones to the Users.

Welcome Screen

App Registration

Parking Zone List
Mobile Application

**SMART PARKING ZONE**

**Zone Status**
- Total Slots: 9
- Left Vacant: 2
- Right Vacant: 1
- Price: 20/Hr

**Vehicle Status**
- Veh. No.: AP35AF4234
- Zone: Dondaparthy
- Time: 13:14 Hrs
- Total: Rs. 270

**PAYMENT**

**NAVIGATE**

**Navigation to Parking Zone**

**Payment Process**
Admin or officials can know the status of the Parking Lots through the portal.

Operators can complain an Issue about the hardware or software of Parking Lot & also track the details of resolved Issues.

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### SMART PARKING MANAGEMENT PORTAL

#### Login Page

<table>
<thead>
<tr>
<th>Unique ID:</th>
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</thead>
<tbody>
<tr>
<td>Password:</td>
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</tr>
</tbody>
</table>

**Sign in**  
Or  
**Register**

#### Login Screen

#### Web Portal with the Issue report details, issue resolve, payment pending etc.
Web Portal – Issue Report & Resolve

Issue Reporting about a Parking Lot

Update the resolved Issue details
**Web Portal – Issue Verify & Open Issues List**

### Verification of Resolved Issues

#### Selected Issue:

- **Open Issue:** [Select Issue]
- **Ticket ID:** [Select Ticket ID]
- **Location Name:** [Select Location]
- **Issue:**
- **Assigned To:** [Select Operator]
- **Resolved By:** [Select Staff]
- **Resolved Time:** [mm-dd-yyyy]
- **Resolve Notes:**
- **Verified By:** [Select Operator]

#### Open Issues List between the selected dates:

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Open Issues List between the selected dates
**Web Portal – Payment Pending & History**

### Payment Pending Details

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### Payment History Details from 2018-05-01 'to' 2018-05-17

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**List of Payment Pending vehicles**

**History of all vehicles used Parking Lot**
Advantages

- Scalable Enterprise Architecture.
- Database Synchronization with Central Server.
- Highly customizable to any type of parking lot.
- ANPR Camera Detection works for vehicles travelling at high speed as well.
- Entire Parking and billing can be automated from customer's perspective.
- Dedicated Surveillance system which can store the video data of 2 months duration.
- Longest battery life of 3 yrs for the Wireless vehicle detection sensors.
- Less man-power to maintain the parking zone.
- Works in almost all weather conditions.
- Manual operation is possible incase of failure of network, hardware etc.
Limitations

- The Automated Number Plate Recognition algorithms and software detection efficiency is 97% in practice. i.e. 3 number plates data may be corrected by the operator for every 100 Cars under normal operating conditions.
- Operator should verify every car number even if the automatic number detection is correct.
- It is network dependant; A network failure will interrupt the functioning of the system. A Fall back connection should be used, Offline mode is possible with local server.
- Extreme weather conditions like heavy rain may decrease the detection efficiency of the cameras.
Project Development

- Cybercinatics will design, develop and deploy a customized Smart parking system as proposed here.
- Cybercinatics supplies the hardware, software and manpower to implement the system.
- Provides initial training to the operators and maintaining staff of the parking zone one time after integrating the whole system.
- Supports the System after Go-Live as per the project requirement.
- Follows required standards in every stage of the project.
- Total Time of Project Completion: 3 to 6 months
References

- ANPR Camera
  https://www.youtube.com/watch?v=LBrmElQinTc

- ANPR Night Mode
  https://www.youtube.com/watch?v=IP0v2JggJOk

- ANPR Benchmark Comparison
  https://www.youtube.com/watch?v=j50K51Lu_lI
Reach us at

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