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Mémoire

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Filière: **Informatique**
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Thème

IOT SMART PARKING SOLUTION: RFID-BASED ACCESS WITH
LICENCE PLATE RECOGNITION SYSTEM

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Urban areas around the world experience constant exponential population growth and an increasing number of vehicles on the streets, and as a result, traditional parking operators with their classic infrastructure that requires a lot of human intervention are struggling to meet this enormous demand.

Faced with this problem, one can only think of an intelligent parking system as a solution, and thanks to IoT technology, this solution is easy to implement and easier to use. IoT Intelligent parking systems use a variety of devices and technologies such as sensors, connectivity, and data analysis.

These systems enable real-time monitoring of parking spaces and provide accurate information about availability and occupancy. Drivers can access current parking data via mobile apps or electronic signage, enabling them to quickly find free parking spaces and reduce unnecessary search times. This not only increases driver comfort but also reduces traffic congestion, lowers carbon emissions, and optimizes fuel consumption.

Key words: Parking System, Connected Objects, IoT, Licence Plate Detection and Recognition, Automation, System Architecture, RFID, Urban Mobility, Parking Management.

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- ZIANE Mohamed.

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- BELFAR Ilyas.

DEDICATED

*I sincerely dedicate this work to my late grandfather **MEZROUAI Mohamed Saleh**, my late grandmother **MEZROUAI Kheira (Dhawia)** and my late aunt **MEZROUAI Rafika**, I pray to Almighty God to have mercy on all of them, forgive them, and grant them the highest ranks in his Paradise.*

- ZIANE Mohamed.

DEDICATED

*I sincerely dedicate this work to my late grandfather **SEGOUAT Mohamed Saleh**, my late grandfather **BOUSENANE Mohamed**, my late uncle **SEGOUAT Omar** and my late grandmother's aunt **HANNACHI Fella**, I pray to Almighty God to have mercy on all of them, forgive them, and grant them the highest ranks in his Paradise.*

- SEGOUAT Mohcene Abdelouahed.

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May this work be the realization of your wishes and the result of your unwavering support.

- BELFAR Ilyas.

IoT Internet of Things.

IIoT Industrial Internet of Things.

IPS/SPS Intelligent/Smart Parking System

SPT Smart Parking Technology.

RFID Radio-Frequency Identification.

ANPR/ALPR Automatic Number/License Plate Recognition.

OCR Optical Character Recognition.

LCD Liquid Crystal Display.

YOLO You Only Look Once.

CNN Convolutional Neural Network.

OpenCV Open Computer Vision.

DES Discrete Event Simulation.

MQTT Message Queuing Telemetry Transport.

HTTP Hypertext Transfer Protocol.

CoAP Constrained Application Protocol.

LoRaWAN Long Range Wide Area Network.

UDP User Datagram Protocol.

MERN MongoDB - Express.js - React.js - Node.js.