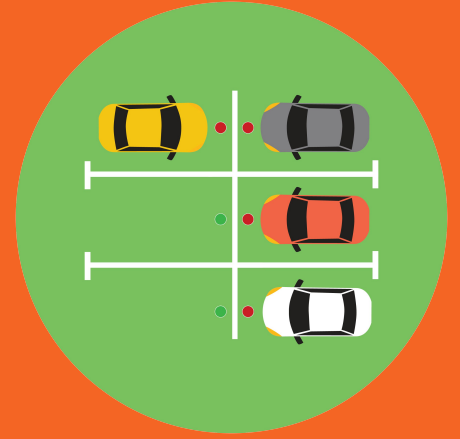

Team : HIMANI

IIIT BHUBANESWAR



A one-stop solution for hospital parking

THE FLOW OF EVENTS:

- **NUMBER PLATE DETECTION:**

It is done while entering into the parking space which is used for identification purposes that can be used for **Theft Control** and **Database Management**.



● CAR TYPE DETECTION

→ Category of cars is found out for the ease of allocation of lane according to the size of vehicle.



Honda Civic 1986



Honda Civic 1991



Honda Civic 2004



Honda Civic 2010



Honda Civic 2015



Toyota Camry 1986



Toyota Camry 1991



Toyota Camry 2004



Toyota Camry 2010



Toyota Camry 2015

- **RFID cards/tokens:**

RFID cards are assigned to the visitors/patients on an one time basis with a map on it while tokens are provided to the doctors permanently for ease of reaching the parking spot allotted to them.



Sensor based parking:

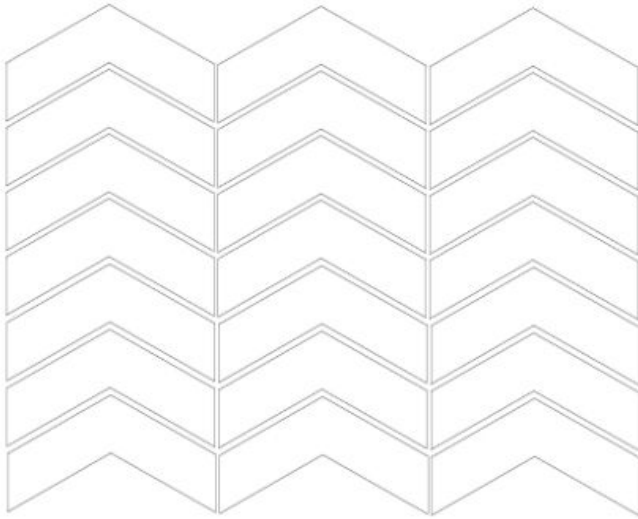
- Ultrasonic and hall magnetic sensors are used for the detection of vehicle in the parking spot.
- NRF Sensors are used for Long Range and Long Life.



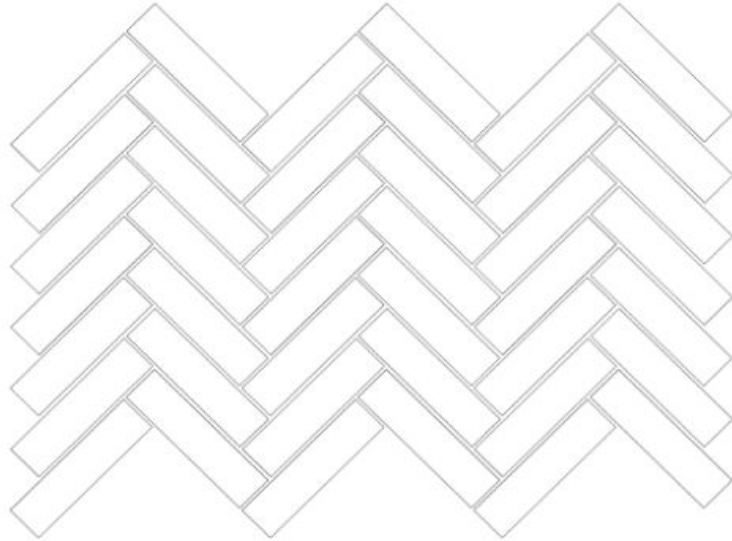
DYNAMIC PAYMENT:

Dynamic parking fee payment is generated taking into account the time the car had been parked.

Comparison between different parking patterns:



CHEVRON PATTERN



HERRINGBONE PATTERN

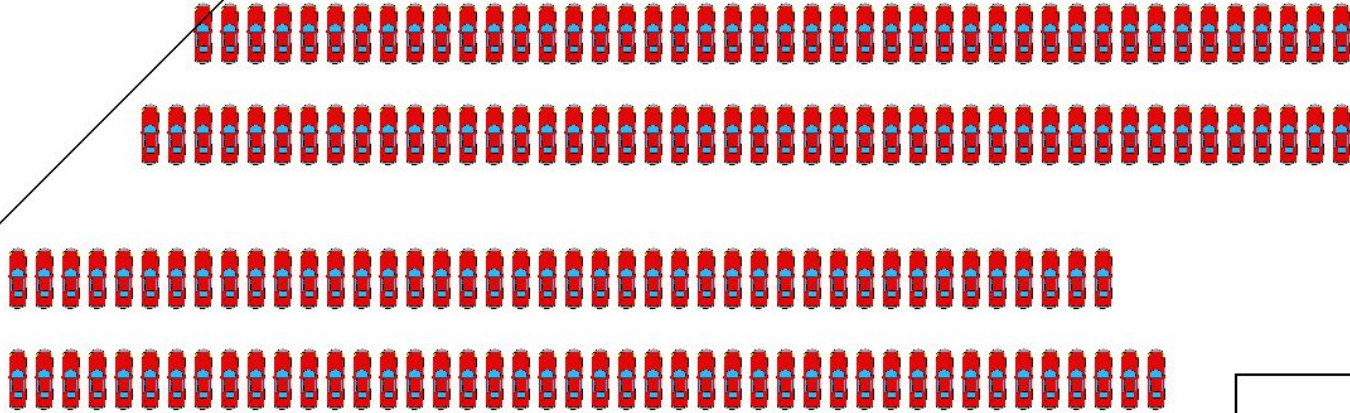
—

In interlocking patterns two lanes of traffic are required and hence wastage of lane area occurs and moreover this solution is restricted to a uniform area.

That is why we switched to a better mathematical approach.

ILP based optimization:

Integer Linear Programming Based Optimization



On the basis of mathematical analysis and Integer Linear Programming we will maximise the density function

$$\text{Density of cars} = (\text{Area of cars} / \text{Total Area}).$$

Using an optimal parking angle has a huge impact on adding more parking spaces for the same parking area. We optimised the density with respect to the constraints of limited length and width of parking space and solved the **Integer Linear Programming**.

DEMONSTRATION

