Problem Set:

Your consulting job with Driverless Cars from Homework 1 is going well, and they want to proceed to the next step: Defining three features for the driver-free parking function that allows cars to park themselves without assistance from humans.

In this assignment, you will have the following deliverables:

- Identify three features relevant to driver-free parking.
- Describe each of the three features as a use case.
- Describe each of the same features as user stories.
- Describe the advantages and disadvantages of use cases and user stories for this task.

Submit your completed document.

Solution:

I. Identify three features relevant to driver-free parking

A complicated system, such as a driver-free parking system, requires the following features:

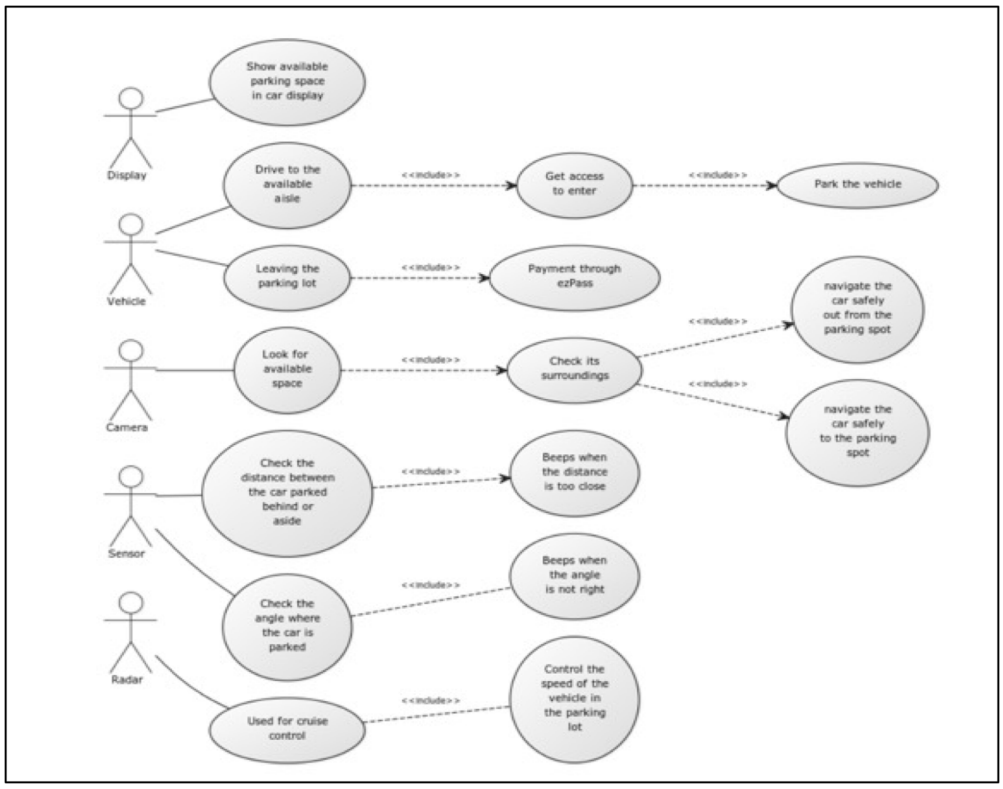
a) A sensor to monitor and scan in many directions for a parking slot.
b) A camera offers the input required to safely maneuver the vehicle and inspect its surroundings.
c) A radar used to calculate object distance, facing angle, and vehicle speed.

Other sensors may be used, such as an ultrasonic sensor to send sound waves and detect the distance between objects, a touch sensor to provide a sensation of touch, and a gyro sensor to measure an angle. Radars are more suitable since they employ electromagnetic waves rather than sound waves. They are less impacted by external factors such as temperature, light, and so on. All the functions are utilized for cruise control and automatic braking. It enables the vehicle to stay up with the vehicle it is following, slow down as it gets closer to the other vehicle, then accelerate back to the pre-set speed.

II. Describe each of the three features as a use case

After the occupants have gone, the driving system parks the car at a secluded spot. It also looks for parking and re-parks the vehicle. This reduces time spent looking for a parking spot and walking from and to it. When it is not necessary to open the door, the parking space is utilized efficiently.

USE CASE – Autonomous Vehicle Parking
ACTORS – Sensors, Camera, Radar, and Car



III. Describe each of the same features as user stories

a) Looking for a parking place with a camera.

User Story – As a car owner, I want the camera to search for a parking place in the display so that the robot may park.
Priority – 1. Story Points: 3.
Description – I want the car to be parked in a secure location.

b) Sensor for sensing the environment.

User Story – As a car owner, I want to have the sensor to analyze the parking angles and the space between other vehicles to reduce accidents.
Priority – 2. Story Points: 3.
Description – I want the car to monitor the distance between cars and the angle at which the vehicle is parked. It can help to avoid collisions with and between other cars.

c) Radar to control speed within the parking lot

User Story – As a car owner, I want the radar to limit the speed of my vehicle within the parking lot to a maximum of 8 to 10 mph.
Priority – 3. Story Points: 2.
Description – To avoid damage, I want the car to control and keep the same speed while parking. All these user experiences can save time spent looking for parking and walking to and from the lot. This will help to keep my insurance prices low.

IV. Describe the advantages and disadvantages of use cases and user stories for this task

Following are advantages and disadvantages for use cases and user stories:

a) Use Cases

The most useful visualization approach. It is easy to learn. It's like a prototype that may be expanded with new features. It depicts the system's functional requirements. It is useful for modeling. A step-by-step procedure. It lacks an object-oriented idea. There is no formally recognized representative. The non-functional need is missing.

b) User Stories

Simple communication language between the client and developer. Facilitating time estimations and priorities. Improve reusability. Lack of step-by-step approach. No visualization of thoughts. Lack of information regarding the method of development. Missing the non-functional requirements.