

Homework 02: User Stories and Use Cases

Features

1. The car can identify what a valid parking space is.
2. The car can determine if a parking space is legal and requires payment in the form of meters or passes.
3. The car is aware of safety concerns regarding the space.

Use Cases

Feature: The car can identify what a valid parking space is.

- Actor: The actor in this case is the driver. The driver engages the parking routine and the vehicle begins searching for nearby parking spots.
- Basic Flow: The vehicle identifies an unoccupied spot at the side of the road and parks in it.
- Alternative Flow: The vehicle identifies an unoccupied space at the side of the road and goes to park in it. However, on closer inspection the vehicle discovers a fire hydrant is in the way, and therefore disengages the parking routine and warns the user.
- Alternative Flow: The vehicle identifies an unoccupied space at the side of the road and goes to park in it. Before the parking operation is complete, the driver spots a more favorable spot and disengages the auto park. Manual control is reverted to the driver.

Feature: The car can determine if a parking space is legal and requires payment in the form of meters or passes.

- Actor: The actor in this case is the driver. The driver engages the parking routine, the vehicle finds a spot and investigates to see if it requires payment.
- Basic Flow: The vehicle utilizes its cameras, sensors and GPS system and determines that the spot it is currently parked in does require payment. It prompts the driver to determine if this is acceptable or if a new space is required.
- Alternative Flow: The vehicle identifies that this parking space is in a paid zone but recognizes that the date and time provide for free parking and the driver prompt is overridden.
- Alternative Flow: The driver adds a local parking pass to their vehicle profile. This removes the payment required flag on all associated spaces.

Feature: The car is aware of safety concerns regarding the space.

- Actor: The actor in this case is the driver. The driver engages the parking routine which discovers a spot. While the vehicle is in the process of parking it continues to monitor the space for any sudden obstructions or environment changes.

- **Basic Flow:** The vehicle utilizes its cameras and sensors to monitor a space while it is parking. Once successfully parked, these items are disabled.
- **Alternative Flow:** As the vehicle is in the process of parking it detects another car moving into the same space. If this car is within a certain distance, the vehicle activates its horn, stops moving and will require a manual override by the driver to resume parking.
- **Alternative Flow:** Upon pulling into a space, the vehicle detects what it perceives to be broken glass on the ground via its cameras and sensors. It halts, notifies the driver, and begins to exit the space. If the driver wishes, they can override this decision and the normal parking routine will be re-engaged.

User Stories

Title: Identify Valid Space

Description: As a user I want the car to detect what is a valid space so that I do not need to spend time doing it myself.

Acceptance Test: The parking routine places the car in a space that is a valid parking spot, not just any empty space on the side of the road.

Priority: 1

Story Points: 5

Title: Determine Costs of Space

Description: As a user I want the car to determine if a space will cost money so that I will not receive tickets or other legal penalties.

Acceptance Test: The parking routine utilizes all available data sources such as location, street signs, and meters as to see if a cost is required for this parking space, and uses logic as well as user data to see if this is applicable to the user.

Priority: 3

Story Points: 13

Title: Monitor Space Safety

Description: As a user I want the car to maintain constant situational awareness while parking so that its safety, my safety, and the safety of others are not put at risk.

Acceptance Test: The parking routine monitors all attributes such as nearby entities and environmental factors to determine if entering and parking in a space is sufficiently safe.

Priority: 1

Story Points: 8

Advantages and Disadvantages

While user stories are very concise, easier to write, and are more flexible, use cases may be better utilized for this project. Use cases offer a more complete picture of the system requirements and its operational environment. This means that system developers will have more context and a better understanding of the project. As this project is large and requires significant collaboration with multiple different entities (sensor designers, the automobile manufacturer, the software team etc.) this added context will be a benefit. This also allows a more effective risk decrease, as “worst case scenarios” of system operation are provided by use case alternative flows. Seeing as how the risk of this project is high, this is a major advantage.