Liam Brew
SSW 555

Professor Ens
7 December 2020

Homework 11: Scaled Agile

Strategic Direction

The Strategic Direction is an Epic that represents the general plans and strategy of the company for the next few years to come. The Strategic Direction that will be under discussion here is a broad movement by the company to improve upon the safety of their driverless software. For the intents and purposes here, the company will seek to reduce the amount of accidents involving vehicles that use their software by ten percent over the next five years. In doing this, Driverless Software seeks to attract more customers to their business through this increase in safety ratings as more car companies would want to business with them due to this higher reliability. As Driverless Software's business increases, more investment opportunities will be secured which further develops the growth of the company. Additionally, favorable safety ratings can benefit the company's public presence , which may also indirectly grow the brand as well.

Releases

The first release in furthering this Strategic Direction would be automatic horn honking. This feature will benefit safety as it will automatically alert other drivers and pedestrians when there is a perceived sense of danger. This does not require the attention of the driver, ensuring that it will always take place and that there are no blind spots or gaps in judgement to consider. Additionally, by honking the horn when necessary a greater sense of situational awareness is demonstrated, which may help reduce liability in the case that something does in fact go wrong.

The second release that will assist in realizing this Strategic Direction would be automatic lane changing. Changing lanes can often be a dangerous endeavor and is something one must do every time they go for a drive. By automating this process, the system minimizes the impact of human error on this practice, relying on mathematical data and split-second calculations to make the optimal decision on how to proceed. This helps reduce the impact of effects such as blind spots and velocity. Additionally, by having a successful lane changing feature the company is further benefitted beyond safety terms. To many this will demonstrate a high level of sophistication and usage and will help drive software sales and contracts going forward.

User Stories

The following stories and tasks have been planned for each of the intended releases.

Automatic Horn Honking

1. The system needs to activate the horn only when it is appropriate to do so and must not consistently run it.
    a. Task: use distance sensors to honk the horn when the car is in motion and an entity enters within an **x** meter radius in front of it.
2. The car is behind another car at a stoplight. The light turns green and the other one does not move. The system must lightly activate the horn for a brief period to get the other driver's attention.
    a. Task: have a separate 'idle' mode for when the car is waiting at a light.

    b. Task: while the car is in 'idle' mode detect its place in the queue (two cars from the light, three etc.)
    c. Task: if the light turns green and the car is not first in queue, gently activate the horn.
3. The system must allow the driver to retake control of the horn at any time without delay.
    a. Task: engineer an interrupt that allows an instantaneous reversion to manual control and disabling of all horn-related software.
4. The system must not utilize the horn when it is a neighborhood that bans doing so.
    a. Task: use GPS mapping to disable horn usage in these areas.
    b. Task: manual override still works.
5. The system must not activate the horn when the car is in line with the behavior of other vehicles (ex: another car is passing in the adjacent highway lane).
    a. Task: make the horn-trigger radius larger at the front and rear of the vehicle than at its sides.

Automatic Lane Changing

1. The system must be able to detect if the lane is currently clear to move into.
    a. Task: use distance sensors to scan the adjacent lane as well as in front of and behind the vehicle
    b. Task: using navigational and environmental data determine if the distance is sufficient enough to provide for a lane change.
2. The system must ensure the lane is valid (ex: it's not a bus lane).
    a. Task: use sensors to detect any coating on the pavement typical of said special lanes.
3. The system must ensure that the vehicle is not violating laws by moving into this lane.
    a. Task: use image processing to determine what type of road lines the vehicle would have to cross over.
4. The system must adopt to the traffic conditions in the new lane (ex: moving faster when in the left lane on the highway).
    a. Task: determine the velocities of cars behind and in front of the vehicle and match their speed.
5. The system must yield right-of-way where appropriate when changing lanes.
    a. Task: track all nearby vehicles in both the current and new lanes, their velocities, and their distances.
    b. If while changing lanes a vehicle behind the car speeds up, cancel the change and revert to the original lane until it is safe to change again.