Platooning System

Tasks

1. **Identify which data/signal/events are required for the interaction / communication between the trucks**

Specify an appropriate protocol

Use State Machines for the model-based specification

Requires Info

Requires Data

For the master:

- Connected Slaves: the slaves instance and their status (coupled or decoupled)
- Location
- Speed

For the slave:

- Location

Required Signals

For the master:

- Steering
- Breaking
- Stop signal
- Couple
- Obstacle sensor

For slave :

- Send decouple signal (Used for both situation when pedistrainian passing the route or lost connection)
- Obstacle sensor

Required Events

for master :

- decoupled slave
- Stop notification

for slave :

- auto drive (happens when communication error happens)

UML model:

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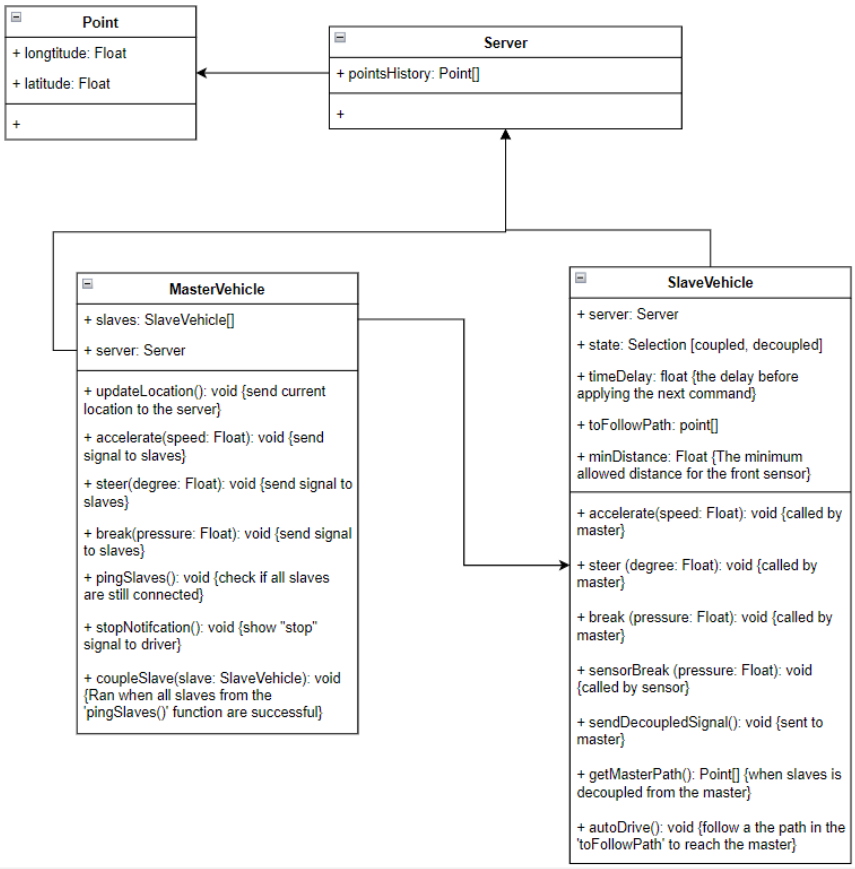


2. Identify the relevant control behavior for the trucks

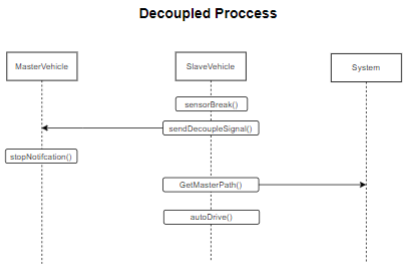
a. How can the distance to the precedence truck be guaranteed
b. What happens in cases of a e.g. communication failure - > is your system robust / still stable?
c. Use State Machines (and/or Activity Diagrams) for the model based specification

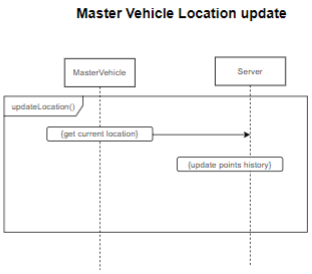
a. distance can be guaranteed by always measuring distance in order to not exceed fixed distance that is set by developer

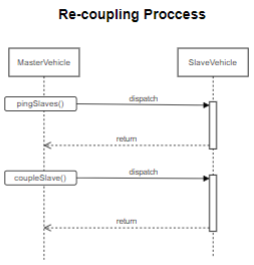
b. Each signal sent to the slaves always contains the specified path connecting the slaves from the point they are in to the emergency parking. In case of connection failure, the slave vehicles move to the emergency parking slot following the given path based on the last update received by the system. The master then follows the same path to meet the slaves at the specified location and start their journey once more.

Communication protocol that is l used : V2V

UML model :







State Machine Diagram