

# VEHICLE TRAIN

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## TASK:

Creating the perfect "train" of robot cars. The goal is to make the car behind the 'Lead' vehicle follow its path as closely as possible. Alternatively, it can follow the lead car next to it in a grouping like a combine harvester and a tractor in a harvesting operation.

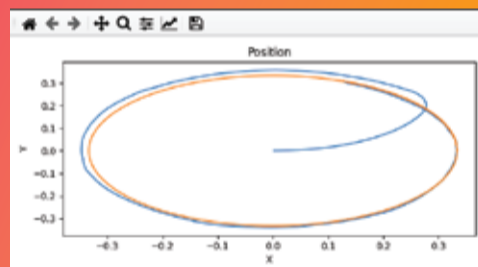
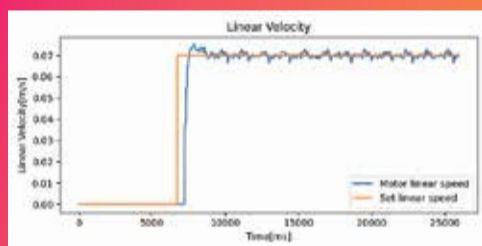
## SOLUTION:

Our solution is divided to the 2 main parts:

- Modelling and simulations - to check (alebo ine vhodnejsie slovo) the behaviour of cars and to validate proposed methods of control.
- Complex application - to provide communication platform, to configure the cars and to control the motion of cars (trajectory tracking)

## Modeling and simulations:

- Identification of car's parameters
- Controller for each DC motor
- Simulation of speed control
- Position controller for each car
- Simulation of trajectory tracking



## Firmware:

- Checking and control of wheels speed
- Reading the car's position
- Position controller - trajectory tracking
- Communication between cars
- Communication between car and server

## Frontend:

- Configuration of car's motors
- Trajectory settings
- Starting the ride for the 'Lead' car
- Checking the position of cars in realtime view

## Backend:

- Communication between cars - TCP socket
- Communication with frontend - web socket
- Sending / reading data from the database
- Connection between car - web application
- Trajectory modul - generate parametric trajectory

