# AutoDrive: System Engineering Design

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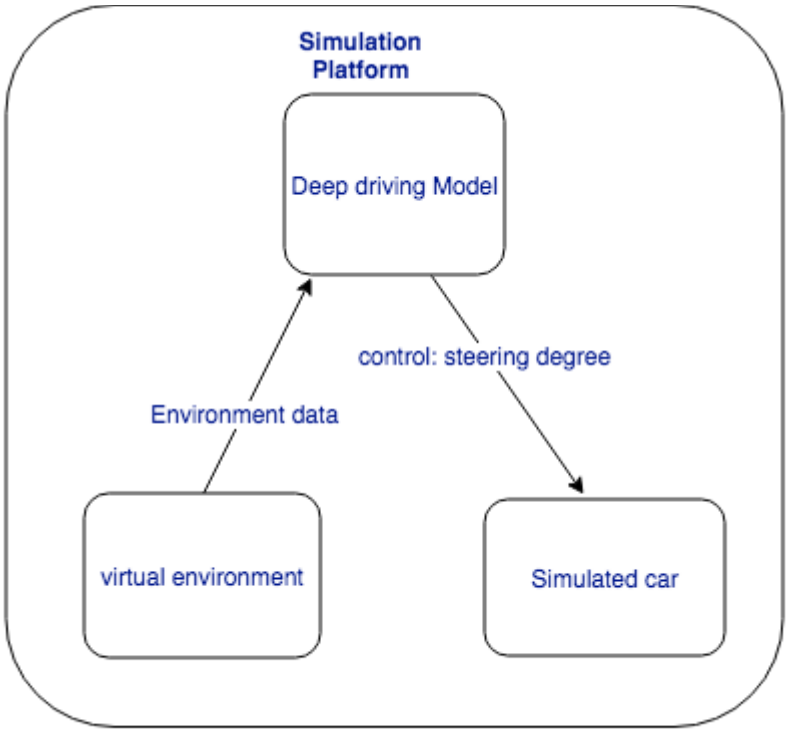
Our project has two major phases: 1) during the **testing phase**, we develop a self-driving model on a simulation platform and train the model with simulated data, 2) and during the **deployment phase,** we will deploy the trained model on the Raspberry Pi on the physical car.

## Testing

### Diagram




### Description

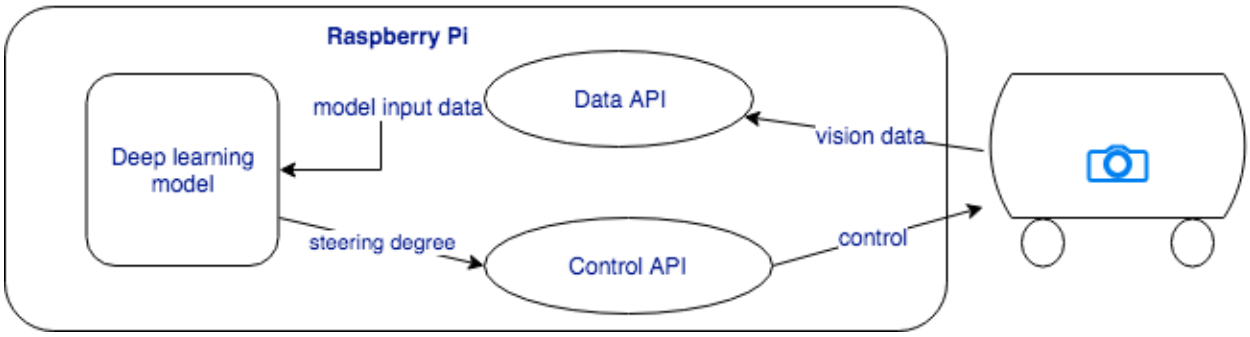
We will use a simulation platform to test and train the deep learning based decision algorithms that controls the car (e.g. turning and stopping) to respond to different driving environments.

- Input data: simulated environment data from the CARLA simulation platform

- Path Planning: the model is responsible for computing the environment variables and determining the next state of the car
- Output: the deep learning model will output steering degree that controls the simulated car; the output will be same as the output to the Control API on the physical car

# Deployment

### Diagram




### Description

Once we have a reasonably working path-planning model, we will deploy the model onto the Raspberry Pi and run the car prototype in the real-world environment.

- Input: vision and ultrasonic data collected from the camera and the ultrasonic sensor, the data will be relayed to the model through the Data API
- Data API: pre-processes and transforms the data into inputs for the deep learning model
- Path-planning model: the model is responsible for computing the environment variables and determining the next state of the car
- Output: the model computes the next state for the car and the corresponding car commands will be transmitted to the physical car through the Control API