# Car-to-Car Communication

## Introduction

This project will establish a form of communication between RC cars driving in a straight line. The communication will pass through a smart ‘hub’ which knows the position, acceleration, … of every car.   
The communication goes both ways, as the car needs to send all its information to the hub and the hub needs to be able to send controls back to the car.

## Communication

The communication will be established through wi-fi. The cars will be equipped with a microcontroller containing a chip that can set up a wi-fi connection. The microcontroller will be discussed in another paragraph.   
The ‘hub’ will exist of a laptop on which a server is running. The server will log the position of every car and will be able to send commands like break() or accelerate() to each car individually. Finally the hub needs to be ‘intelligent’ as it needs to automatically adjust the cars according to the first one which will be controlled by a remote.

## The Microcontroller

The microcontroller best fit to our needs is the NodeMCU. This microcontroller has an integrated ESP8266 WiFi component and is pretty cheap which is necessary as our budget is limited and the RC cars will cost quite a bit.

NodeMCU is programmed in the ‘lua’ scripting language but there are a lot of language converters out there which makes it possible to program it in java, python or C.

## The RC Cars

Two or three RC cars are needed for this project. We will attach our microcontroller on top of the one already integrated in the RC car. We do this because replacing the integrated microcontroller would mean we have to figure out exactly how the RC car works (control the wheels, …) and this is not included in the scope of this project.

First, we’ll figure out which pin does what on the RC car. We’ll power each pin on the integrated microcontroller to see which does what. Once we figure out which pin causes acceleration, brake, …, we can just connect those to our microcontroller and work from there on out.