0.1 FreeRTOS

When designing a autonomous vehicle factors like: precise timing, responsiveness, and predictability are crucial for the software. If the software dose not process inputs from sensors fast enough it could result in a accident. These factors can be forfeited by using a real-time operating system like FreeRTOS. With RTOS task scheduling, actions like stopping movement when a obstacle is blocking the way, is executed within a specified time constraint. Meaning that the action of stopping the vehicle is not blocked by another action, thus preventing accidents.

0.1.1 The Espressif flavor

One of the reasons we choose the ESP32 MCU was to utilize its capability with FreeRTOS. The ESP32 liberty uses a custom made flavor made for the ESP32 by Espressif. One of the key difference for this flavor is its support for Dual-Core processors. Meaning that tasks can be distributed across two cores, instead of the original one core support in FreeRTOS. Another plus is the presents of a HAL, meaning that MCU change in the ESP ecosystem is durable without the big code manuever. time-consuming

0.1.2 Development enviroment

A familiar development environment is key for ensuring quality and productivity coding. It is time-consuming to learn the way around a new IDE, for this reason it is a big plus that Espressif have made a interaction of there ESP-IDF into the VS-Code IDE. VS-Code is a IDE that everyone that participate in the project are familiar with and it has a wide variate of tools available to help development.