Moving Car System Design

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Sprints

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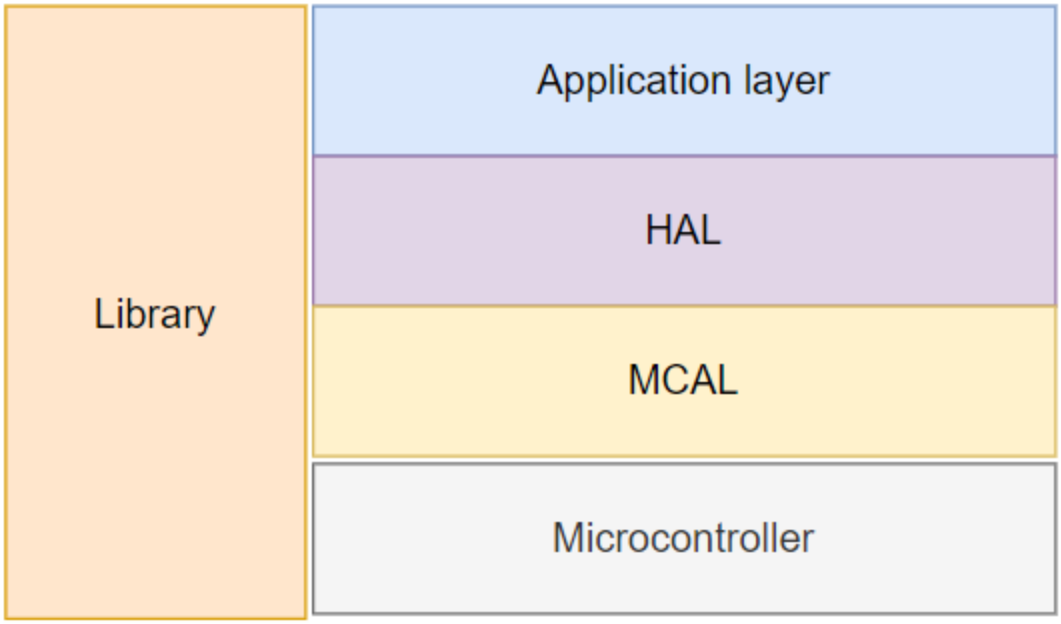
Overview

It's a design of four-diving wheel robot, which has a specific moves

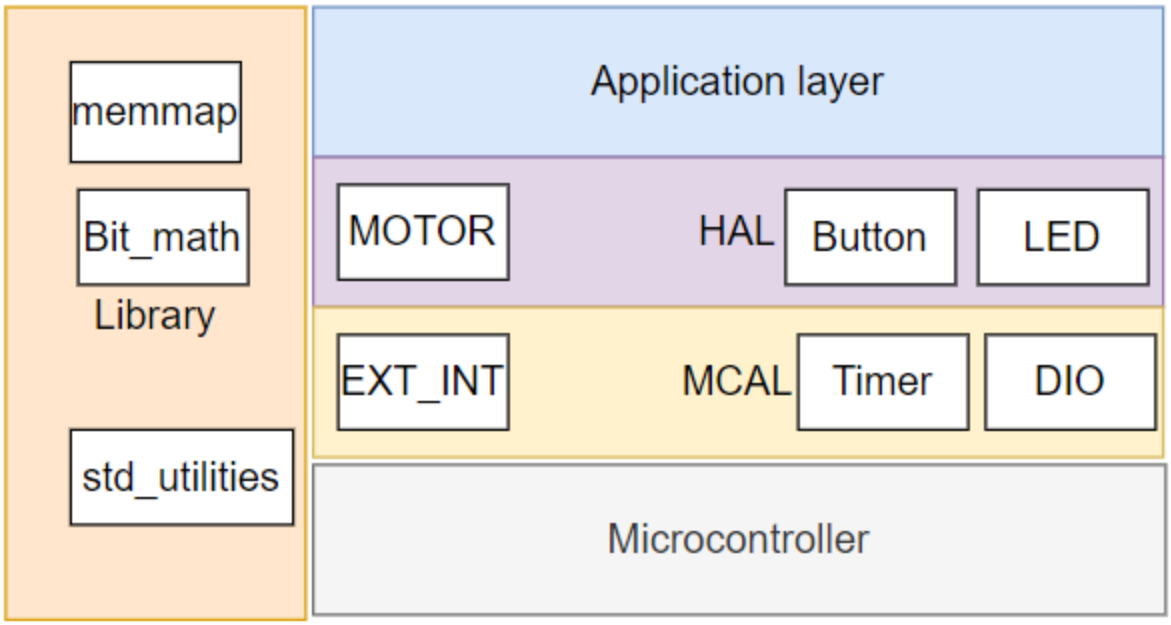
Goals

1. Create the layered architecture.
2. Specify System module.
3. APIs for each module.

Layered Architecture



System Module



API

- DIO

uint8_t dio_init(uint8_t port, uint8_t pin, uint8_t mode);

uint8_t dio_read(uint8_t port, uint8_t pin, uint8_t* state);

uint8_t dio_write(uint8_t port, uint8_t pin, uint8_t state);

uint8_t dio_toggle(unt8_t port, uint8_t pin);

- Timer

uint8_t timer_init(st_timer_config_t configurations);

uint8_t timer_start(uint63_t ticks);

uint8_t timer_read(uint8_t* value);

uint8_t timer_set(uint8_t value);

uint8_t timer_check_status(uint8_t* status);

- PWM

uint8_t pwm_init(st_pwm_config_t configuration);

uint8_t pwm_start(en_freq_t frequency, uint8_t duty_cycle);

uint8_t pwm_stop();

- External Interrupt

uint8_t ext_enable(st_ExtInt_t interrupt);

uint8_t ext_disable(st_ExtInt_t interrupt);

uint8_t ext_trigger(st_ExtInt_t interrupt, en_trigger_t trigger);

uint8_t ext_SetCallBack(st_ExtInt_t interrupt, void(*pf)(void));

- Button

uint8_t button_init(uint8_t port, uint8_t pin);

uint8_t button_read(uint8_t port, uint8_t pin, uint8_t* state);

- LED

uint8_t led_init(uint8_t port, uint8_t pin);

uint8_t led_on(uint8_t port, uint8_t pin);

uint8_t led_off(uint8_t port, uint8_t pin);

- Motor

uint8_t motor_init(uint8_t port, uint8_t pins[2]);

uint8_t motor_forward(uint8_t port, uint8_t pins[2]);

uint8_t motor_backward(uint8_t port, uint8_t pins[2]);

uint8_t motor_stop(uint8_t port, uint8_t pins[2]);

uint8_t motor_right(uint8_t port, uint8_t pins[2]);

uint8_t motor_left(uint8_t port, uint8_t pins[2]);

- Application

void app_init();

void app_start();