WAITER HOME ROBOT

# Processor architecture

## Moving Processor

The moving processor (microcontroller) should be low power and easy to program.

Arduino nano is chosen.

Should be able to be controlled from an android application.

Should control the 4 engines using pwm and should track the distance and angle of the moving platform:

* PWM expander should be used to free pins.
* Two engine drivers should be used to have 4wd.
* Each wheel should have an encoder.
* RFID should be present to read ultralight stickers with moving instructions.
* RFID should be lower from the main chassis to read stickers and to have ground clearance.
* Moving instructions from RFID should be send back to main processor.
* It should be controlled by main processor using commands on serial interface.

Sensors:

* Sensors should stop the robot if something is in the path of the robot and distance should be reported back to the main processor.
* Sensors should not use a lot of pins from the microcontroller (PCA8574 as sensors interface is preferable).

## Arms Processor

The arm processor should be able to control the arms in independent or link situation.

Arduino nano is chosen.

Arm architecture:

* Should have shoulder power by servo (MGM966).
* Should have elbow power by servo (MSGM966).
* Should have roll of gripper power by servo (9g servo).
* Should have gripper power by servo (MGM966).
* Should have distance sensor on gripper to know when to close.

Technical specification:

* If arms are not needed, they will be power off.
* The two arms should be able to move independently.
* The two arms should be able to move a desired position with grippers at horizontal position.
* Should be controller by master processor.

## Main processor

Raspberry Pi Pico is chosen for high processing power and low consumption.

It should interface with all slave processors (moving and arms).

Should have microSD card to read paths.

Should have LCD to display information.

If the slaves are not needed should be able to power off slaves.

Should have a range finder which rotate 180 degrees.

# General considerations

Level shifters should be present for the interface between 3.3V and 5V.

Power should be 6V Lead-Acid battery or Lithium Ion 7.2V.

Should be at least 50cm high.