Software Detailed Design Requirements

# Résultat de recherche d'images pour "sambot esigelec"Introduction

A small bot on wheels needs to be designed. It should be able to move itself in an environment containing obstacles.

The obstacles can be detected and avoided thanks to an ultrasound sensor placed on a servomotor (sweeping).

Holes must be detected too with an infrared sensor (to prevent falls).

This document lists all the **system requirements**, for the **software only.**

Every requirement is composed of:

* One unique ID following this pattern: SYS\_XXXXX (Five digits),
* A name, which is always a small introduction of the requirement,
* A text, describing what is this requirement for.

# Software Detailed Design Requirements

DDR\_00100

Name: Moving forward

Text: if the user turns on the bot, the motor drives both the wheels.

Function: R\_avancer(unsigned int).

DDR\_00110

Name: Turn right

Text: if a hole is detected, the motor drives both the wheels.

Covers: SYS\_00100

Function: R\_tourner\_droite

DDR\_00120

Name: Turn around

Text: if an obstacle is detected, the motor drives both the wheels.

Covers: SYS\_00100

Function: R\_demi\_tour

DDR\_00200

Name: Get the distance with obstacle in front of the ultrasound sensor

Text: if the function is called, a pulse should be sent to the ultrasound sensor in order to take a measure, the distance should be returned in centimetre.

Function: get\_distance\_ultrason()

DDR\_00205

Name: Detect obstacle

Text: If the distance passed as a parameter is greater than 8 then the function should return 0, else it should return 1

Function: is\_obstacle(unsigned int)

DDR\_00210

Name: Sweep obstacle sensor

Text:

**If the servomotor rotates clockwise:**

If it hasn't reach 45° then it shall keep rotating clockwise else it should rotate counterclockwise.

**If the servomotor rotates counterclockwise :**

If it hasn't reach -45° then it shall keep rotating counterclockwise else it should rotate clockwise

Function: servo\_on()

DDR\_00300

Name: Measure infrared sensor

Text: If the function is called, it should take 5 measures and add them together, then it should return the value.

Function: get\_distance\_infra()

DDR\_00305

Name: Detect hole

Text: if the value is greater than the threshold (400), then it should it should return 1, else it should return 0

Function: is\_hole(unsigned int)

DDR\_00600

Name: Bot start-up

Text: If the user send a command ‘1’ to the MSP430G2553, the variable on should be set to 1

Function: execute\_uart\_command(unsigned char)

DDR\_00610

Name: Bot stop

Text: If the user send a command ‘0’ to the MSP430G2553, the variable on should be set to 0

Function: execute\_uart\_command(unsigned char)

DDR\_00700

Name: Data stop display

Text: If the user send a command ‘2’ to the MSP430G2553, the variable log should be set to 0

Function: execute\_uart\_command(unsigned char)

DDR\_00710

Name: Data start display

Text: If the user send a command ‘3’ to the MSP430G2553, the variable log should be set to 1

Function: execute\_uart\_command(unsigned char)

DDR\_00800

Name: Make a 90 degree turn

Text: If the MSP430G2231 send to the MSP430G2553 that an obstacle has been detected then the motor drives the right wheels only.

Function: R\_tourner\_droite(unsigned int)

DDR\_00810

Name: Make a 180 degree turn

Text: If the MSP430G2231 send to the MSP430G2553 that a hole has been detected then the motor drives the right wheel and drive the left wheel in an opposite direction.

Function: R\_demi\_tour(unsigned int)