#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#include <math.h>

#include "ch.h"

#include "hal.h"

#include "memory\_protection.h"

#include <main.h>

#include "leds.h"

#include "spi\_comm.h"

#include "motors.h"

#include "sensors/proximity.h"

#include "selector.h"

#include "sensors/VL53L0X/VL53L0X.h"

#define delay 50

// defining inter process communication bus

messagebus\_t bus;

MUTEX\_DECL(bus\_lock);

CONDVAR\_DECL(bus\_condvar);

int main(void)

{

halInit();

chSysInit();

mpu\_init();

messagebus\_init(&bus, &bus\_lock, &bus\_condvar);

motors\_init();

proximity\_start(0);

calibrate\_ir();

VL53L0X\_start();//distance sensor

clear\_leds();

spi\_comm\_start();

int prox\_cal[8] = { 0,0,0,0,0,0,0,0 };

int i, j;

int max\_proximity;

int number\_proximity;

int pres\_dist;

int count = 0;

int prox\_avg;

while (1)

{

chThdSleepMilliseconds(delay);

max\_proximity = 0;

for (i = 0; i < 8; ++i) //read the proximity sensor values

{

prox\_avg = 0;

for (j = 0; j < 50; ++j)

{

prox\_avg = prox\_avg + get\_calibrated\_prox(i);

}

prox\_cal[i] = prox\_avg / 50;

//prox\_cal[i]=get\_calibrated\_prox(i);

if (prox\_cal[i] > max\_proximity)

{

max\_proximity = prox\_cal[i];

number\_proximity = i;

}

}

pres\_dist = VL53L0X\_get\_dist\_mm();

if ((max\_proximity > 30) && (pres\_dist > 100))

{

count = 0;

/\*if ((number\_proximity >= 1) && (number\_proximity <= 3)) //if obj at right, turn right

{

left\_motor\_set\_speed(300);

right\_motor\_set\_speed(-300);

//chThdSleepMilliseconds(delay);

}

else if ((number\_proximity >= 4) && (number\_proximity <= 6)) //if obj at left, turn left

{

left\_motor\_set\_speed(-300);

right\_motor\_set\_speed(300);

//chThdSleepMilliseconds(delay);

}\*/

if (number\_proximity <= 3) //if obj at right, turn right

{

left\_motor\_set\_speed(300);

right\_motor\_set\_speed(-300);

//chThdSleepMilliseconds(delay);

}

else //if obj at left, turn left

{

left\_motor\_set\_speed(-300);

right\_motor\_set\_speed(300);

//chThdSleepMilliseconds(delay);

}

}

else if (pres\_dist < 30)

{

count = 0;

left\_motor\_set\_speed(-500);

right\_motor\_set\_speed(-500);

}

else if ((pres\_dist > 40) && (pres\_dist < 400) == 1)

{

count = 0;

left\_motor\_set\_speed(500);

right\_motor\_set\_speed(500);

}

else

{

left\_motor\_set\_speed(0);

right\_motor\_set\_speed(0);

}

}

}

#define STACK\_CHK\_GUARD 0xe2dee396

uintptr\_t \_\_stack\_chk\_guard = STACK\_CHK\_GUARD;

void \_\_stack\_chk\_fail(void)

{

chSysHalt("Stack smashing detected");