SORTING_OBJECTS_BASED_ON_COLOR_AND_-SIZE_GROUP4

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1.1 File List

Here is a list of all files with brief descriptions:

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File Documentation

2.1 Desktop/final_grp4/grp4/Group_4/cover_field.c File Reference

```
#include <avr/io.h>
#include <avr/interrupt.h>
#include <util/delay.h>
#include <math.h>
#include <avr/delay.h>
```

Defines

- #define FCPU 11059200ul
- #define FCPU 11059200ul
- #define RS 0
- #define RW 1
- #define EN 2
- #define lcd_port PORTC
- #define sbit(reg, bit) reg |= (1<<bit)
- #define cbit(reg, bit) reg &= ~(1<<bit)

Functions

- unsigned char ADC_Conversion (unsigned char)
- void init_ports ()
- void lcd_reset_4bit ()
- void lcd_init ()
- void lcd_wr_command (unsigned char)
- void lcd_wr_char (char)

- void lcd_home ()
- void lcd_cursor (char, char)
- void lcd_print (char, char, unsigned int, int)
- void lcd_string (char *)
- void lcd_set_4bit ()
- void lcd_port_config (void)
- void adc_pin_config (void)
- void port_init ()
- void adc_init ()
- void init_devices (void)
- unsigned int Sharp_GP2D12_estimation (unsigned char adc_reading)
- void INIT_PORTS ()
- void timer5_init ()
- void Left_Speed (unsigned char val)
- void Right_Speed (unsigned char val)
- void INIT_INTERRUPT ()
- void FORWARD (void)
- void REVERSE (void)
- void LEFT_TURN (void)
- void LEFT_TURN_SOFT (void)
- void LEFT_REVERSE (void)
- void RIGHT_TURN (void)
- void RIGHT_TURN_SOFT (void)
- void RIGHT_REVERSE (void)
- void STOP (void)
- ISR (INT4_vect)
- ISR (INT5_vect)
- void ANGLE_ROTATE (unsigned int Degrees)
- void LINEAR_DISTANCE (unsigned int distance)

Variables

- unsigned char ADC_Value
- unsigned char sharp_left
- unsigned char sharp_center
- unsigned char sharp_right
- unsigned char sharp_center_left
- unsigned char sharp_center_right
- unsigned char distance
- unsigned char adc_reading
- unsigned int value_left
- unsigned int value_center
- unsigned int value_right
- float BATT_Voltage
- float BATT_V
- float white_1

- float white_2
- float white_3
- unsigned int shaftCountRight
- unsigned int shaftCountLeft
- unsigned int temp
- unsigned int unit
- unsigned int tens
- unsigned int hundred
- unsigned int thousand
- unsigned int million
- int i = i+1

2.1.1 Define Documentation

2.1.1.1 #define cbit(reg, bit) reg &= ∼(1<<bit)

2.1.1.2 #define EN 2

2.1.1.3 #define FCPU 11059200ul

2.1.1.4 #define FCPU 11059200ul

2.1.1.5 #define lcd_port PORTC

2.1.1.6 #define RS 0

2.1.1.7 #define RW 1

2.1.1.8 #define sbit(reg, bit) reg |= (1<<bit)

2.1.2 Function Documentation

2.1.2.1 unsigned char ADC_Conversion (unsigned char *Ch*)

2.1.2.2 void adc_init ()

2.1.2.3 void adc_pin_config (void)

2.1.2.4 void ANGLE_ROTATE (unsigned int *Degrees*)

2.1.2.5 void FORWARD (void)

2.1.2.6 void init_devices (void)

2.1.2.7 void INIT_INTERRUPT ()

2.1.2.8 void INIT_PORTS ()

2.1.2.9 void init_ports ()

2.1.2.10 ISR (INT5_vect)

2.1.2.11 ISR (INT4_vect)

2.1.2.12 void lcd_cursor (char *row*, char *column*)

2.1.2.13 void lcd_home ()

2.1.2.14 void lcd_init ()

2.1.2.15 void lcd_port_config (void)

2.1.2.16 void lcd_print (char *row*, char *coloumn*, unsigned int *value*, int *digits*)

2.1.2.17 void lcd_reset_4bit ()

2.1.2.18 void lcd_set_4bit ()

2.1.2.19 void lcd_string (char ∗ *str*)

2.1.2.20 void lcd_wr_char (char *letter*)

2.2 Desktop/final_grp4/grp4/Group_4/grp_4_try1.m File Reference

Functions

- imshow (img1)
- compute the size of the ball imshow (img)
- if ((img(k, l, 1)>40 &&img(k, l, 1)< 110)&&...(img(k, l, 2)>=0 &&img(k, l, 2)< 30)&&...(img(k, l, 3)>=0 &&img(k, l, 3)< 10)) img_bin(k
- elseif ((img(k, l, 1)~=0 &&img(k, l, 1)~=0)&&...%(img(k, l, 2)~=0 &&img(k, l, 2)~=0)&&...%(img(k, l, 3)~=0 &&img(k, l, 3)~=0))%img_bin(k
- else img_bin (k, l)=0
- end end end imshow (img_bin)
- imagesc (label)
- while (i~=num)%indicator=0
- if (STATS(i).Area< 400 &&STATS(i).Area~=0)%count_num
- end STATS (num-count_num+1).Area=0
- end if (indicator==0 &&STATS(i).Area~=0)%indent
- obj (indent)

Variables

- clc
- close all
- img1 = imread('2nalls2.jpg')
- img = imcrop(img1,[87.5100 61.5100 113.9800 41.9800])
- j = size(img)
- for k
- l = 1
- STATS = regionprops(label, 'Area')
- i = 1
- indent = 0
- indicator = 0
- count_num = 0
- for m
- end num1 = num-count_num

2.2.1 Function Documentation

2.2.1.1 elseif ((img(k, l, 1)∼=0 &&img(k, l, 1)∼=0)&&...%(img(k, l, 2)∼=0 &&img(k, l, 2)∼=0)&&...%(img(k, l, 3)∼=0 &&img(k, l, 3)∼=0))

2.2.1.2 end if (indicator = =0 &&STATS(i).Area∼=0)

2.2.1.3 if ()

2.2.1.4 if ((img(k, l, 1)>40 &&img(k, l, 1)< 110)&&...(img(k, l, 2)>=0 &&img(k, l, 2)< 30)&&...(img(k, l, 3)>=0 &&img(k, l, 3)< 10))

2.2.1.5 imagesc (label)

2.2.1.6 else img_bin (k, l) [pure virtual]

2.2.1.7 end end end imshow (img_bin)

2.2.1.8 compute the size of the ball imshow (img)

2.2.1.9 imshow (img1)

2.2.1.10 obj (indent)

2.2.1.11 end STATS (num-count_num+ *1*) [pure virtual]

2.2.1.12 while (i∼ = num) [pure virtual]

2.2.2 Variable Documentation

2.2.2.1 clear all

2.2.2.2 clc

2.2.2.3 count_num = 0

2.2.2.4 end i = 1

2.2.2.5 img = imcrop(img1,[87.5100 61.5100 113.9800 41.9800])

2.2.2.6 img1 = imread('2nalls2.jpg')

2.2.2.7 indent = 0

2.2.2.8 indicator = 0

2.2.2.9 j = size(img)

2.2.2.10 for k

Initial value:

```
1:j(1)
    for l=1:j(2)

%                   if((img(k,l,1)>160) &&...
%                   (img(k,l,2)>160))
%
%               img_bin(k,l)=1
```

2.2.2.11 l = 1

2.2.2.12 for m

Initial value:

```
i:1:(num-1)
%               STATS(m).Area=STATS(m+1).Area
```

2.2.2.13 end num1 = num-count_num

2.2.2.14 STATS = regionprops(label, 'Area')

2.3 Desktop/final_grp4/grp4/Group_4/latest_white.m File Reference

Functions

- set (vid,'ReturnedColorSpace','rgb')
- preview (vid)
- imshow (img)
- if ((img(k, l, 1)>240 &&img(k, l, 1)< 260)&&...(img(k, l, 2)>240 &&img(k, l, 2)< 260)&&...(img(k, l, 3)>240 &&img(k, l, 3)< 260)) img_bin(k
- elseif ((img(k, l, 1)~=0 &&img(k, l, 1)~=0)&&...%(img(k, l, 2)~=0 &&img(k, l, 2)~=0)&&...%(img(k, l, 3)~=0 &&img(k, l, 3)~=0))%img_bin(k
- else img_bin (k, l)=0
- end end end imshow (img_bin)
- imagesc (label)
- stop (vid)
- delete (vid)

Variables

- vid = videoinput('winvideo',2,'RGB24_640x480')
- img = getsnapshot(vid)
- figure
- j = size(img)
- count = 0
- for k
- l = 1
- STATS = regionprops(label, 'Area')

2.3.1 Function Documentation

2.3.1.1 delete (vid)

2.3.1.2 elseif ((img(k, l, 1)∼=0 &&img(k, l, 1)∼=0)&&...%(img(k, l, 2)∼=0 &&img(k, l, 2)∼=0)&&...%(img(k, l, 3)∼=0 &&img(k, l, 3)∼=0))

2.3.1.3 if ((img(k, l, 1)>240 &&img(k, l, 1)< 260)&&...(img(k, l, 2)>240 &&img(k, l, 2)< 260)&&...(img(k, l, 3)>240 &&img(k, l, 3)< 260))

2.3.1.4 imagesc (label)

2.3.1.5 else img_bin (k, l) [pure virtual]

2.3.1.6 end end end imshow (img_bin)

2.3.1.7 imshow (img)

2.3.1.8 preview (vid)

2.3.1.9 set (vid, 'ReturnedColorSpace', 'rgb')

2.3.1.10 stop (vid)

2.3.2 Variable Documentation

2.3.2.1 count = 0

2.3.2.2 figure

2.3.2.3 img = getsnapshot(vid)

2.3.2.4 j = size(img)

2.3.2.5 for k

Initial value:

```
1:j(1)
    for l=1:j(2)

%                 if((img(k,l,1)>160) &&...
%                 (img(k,l,2)>160))
%
%             img_bin(k,l)=1
```

2.3.2.6 l = 1

2.3.2.7 STATS = regionprops(label, 'Area')

2.3.2.8 clear vid = videoinput('winvideo',2,'RGB24_640x480')

2.4 Desktop/final_grp4/grp4/Group_4/Main.c File Reference

```
#include <avr/io.h>
#include <avr/interrupt.h>
#include <avr/signal.h>
#include <util/delay.h>
#include <math.h>
#include "cover_field.c"
#include "servo.c"
#include "zigbee.c"
```

Functions

- void uart0_init (void)
- SIGNAL (SIG_USART0_RECV)
- void init_uart0 ()
- int main (void)

Variables

- unsigned int value_left
- unsigned int value_center
- unsigned int value_right
- unsigned int value_center_left
- unsigned int value_center_right
- unsigned int temp
- unsigned int count
- unsigned int temp1
- unsigned int rev_dis
- unsigned int flag_turn = 0
- unsigned int flag = 0
- unsigned int r_count = 0
- unsigned int flag_rx = 1
- unsigned char data
- unsigned int flag_x = 0

2.4.1 Function Documentation

2.4.1.1 void init_uart0 ()

2.4.1.2 int main (void)

2.4.1.3 SIGNAL (SIG_USART0_RECV)

2.4.1.4 void uart0_init (void)

2.4.2 Variable Documentation

2.4.2.1 unsigned int count

2.4.2.2 unsigned char data

2.4.2.3 unsigned int flag = 0

2.4.2.4 unsigned int flag_rx = 1

2.4.2.5 unsigned int flag_turn = 0

2.4.2.6 unsigned int flag_x = 0

2.4.2.7 unsigned int r_count = 0

2.4.2.8 unsigned int rev_dis

2.4.2.9 unsigned int temp

2.4.2.10 unsigned int temp1

2.4.2.11 unsigned int value_center

2.4.2.12 unsigned int value_center_left

2.4.2.13 unsigned int value_center_right

2.4.2.14 unsigned int value_left

2.4.2.15 unsigned int value_right

2.5 Desktop/final_grp4/grp4/Group_4/serial1.m File Reference

Functions

- fopen (s)
- get (s,{'STATUS','Type'})
- fprintf (s,'*IDN?')
- s BytesAvailable while (s.BytesAvailable==0) end out=0
- while (out~=08) out
- set (vid,'ReturnedColorSpace','rgb')
- preview (vid)
- imshow (img)
- if ((img(k, l, 1)>40 &&img(k, l, 1)< 110)&&...(img(k, l, 2)>=0 &&img(k, l, 2)< 30)&&...(img(k, l, 3)>=0 &&img(k, l, 3)< 10)) img_bin(k
- elseif ((img(k, l, 1)~=0 &&img(k, l, 1)~=0)&&...%(img(k, l, 2)~=0 &&img(k, l, 2)~=0)&&...%(img(k, l, 3)~=0 &&img(k, l, 3)~=0))%img_bin(k
- else img_bin (k, l)=0
- end end end imshow (img_bin)
- imagesc (label)
- end end end Sending back to the bot fprintf (s, send) fclose(s) delete(s) clear s stop(vid)
- delete (vid)

Variables

- s = serial('COM26')
- s ReadAsyncMode = 'continuous'
- img = getsnapshot(vid)
- figure
- j = size(img)
- for k
- l = 1
- STATS = regionprops(label, 'Area')
- send data acoorfing to area and color if STATS< "nothinng to be picked"send=28;else if STATS > nothing &&STATS< " max"send=38;else if STATS > max send = 48
- clear vid

2.5.1 Function Documentation

2.5.1.1 delete (vid)

2.5.1.2 elseif ((img(k, l, 1)∼=0 &&img(k, l, 1)∼=0)&&...%(img(k, l, 2)∼=0 &&img(k, l, 2)∼=0)&&...%(img(k, l, 3)∼=0 &&img(k, l, 3)∼=0))

2.5.1.3 fopen (s)

2.5.1.4 end end end Sending back to the bot fprintf (s, send)

2.5.1.5 fprintf (s, '∗IDN?')

2.5.1.6 get (s)

2.5.1.7 if ((img(k, l, 1)>40 &&img(k, l, 1)< 110)&&...(img(k, l, 2)>=0 &&img(k, l, 2)< 30)&&...(img(k, l, 3)>=0 &&img(k, l, 3)< 10))

2.5.1.8 imagesc (label)

2.5.1.9 else img_bin (k, l) [pure virtual]

2.5.1.10 end end end imshow (img_bin)

2.5.1.11 imshow (img)

2.5.1.12 preview (vid)

2.5.1.13 set (vid, 'ReturnedColorSpace', 'rgb')

2.5.1.14 while (out∼ = 08)

2.5.1.15 s BytesAvailable while (s. *BytesAvailable* = =0) [pure virtual]

2.5.2 Variable Documentation

2.5.2.1 figure

2.5.2.2 img = getsnapshot(vid)

2.5.2.3 j = size(img)

2.5.2.4 for k

Initial value:

```
1:j(1)
    for l=1:j(2)
```

```
%                   if((img(k,l,1)>160) &&...
%                   (img(k,l,2)>160))
%
%               img_bin(k,l)=1
```

2.5.2.5 l = 1

2.5.2.6 s ReadAsyncMode = 'continuous'

2.5.2.7 s = serial('COM26')

2.5.2.8 else send = 48

2.5.2.9 STATS = regionprops(label, 'Area')

2.5.2.10 clear vid

2.6 Desktop/final_grp4/grp4/Group_4/servo.c File Reference

```
#include <avr/io.h>
#include <avr/interrupt.h>
#include <util/delay.h>
```

Functions

- void servo1_pin_config (void)
- void servo2_pin_config (void)
- void servo3_pin_config (void)
- void port_init_servo (void)
- void timer1_init (void)
- void init_devices_servo (void)
- void servo_1 (unsigned char degrees)
- void servo_2 (unsigned char degrees)
- void servo_3 (unsigned char degrees)
- void servo_1_free (void)
- void servo_2_free (void)
- void servo_3_free (void)

2.6.1 Function Documentation

2.6.1.1 void init_devices_servo (void)

2.6.1.2 void port_init_servo (void)

2.6.1.3 void servo1_pin_config (void)

2.6.1.4 void servo2_pin_config (void)

2.6.1.5 void servo3_pin_config (void)

2.6.1.6 void servo_1 (unsigned char *degrees*)

2.6.1.7 void servo_1_free (void)

2.6.1.8 void servo_2 (unsigned char *degrees*)

2.6.1.9 void servo_2_free (void)

2.6.1.10 void servo_3 (unsigned char *degrees*)

2.6.1.11 void servo_3_free (void)

2.6.1.12 void timer1_init (void)

2.7 Desktop/final_grp4/grp4/Group_4/zigbee.c File Reference

```
#include <avr/io.h>
#include <avr/interrupt.h>
#include <util/delay.h>
```

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