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1  /*
2  reibot.org
3
4  Demo program for TCS3200 from parallax and the parallax daughterboard
5
6  Call detectColor(out) where 'out' is pinC on the daughterboard. The detectColor will return a 0 if there is nothing color in front of sensor,
7  1 if red is in front, 2 if blue is in front, or 3 if blue is in front. You can comment out all the serial.print.
8
9  If you're tight on pins, remove the taosMode(int) method and all references to it. Remove pins from the TCS3200setup too.
10 If these wires are disconnected the TCS3200 will run on the highest frequency due to internal pullup resistors on S0 and S1
11
12 If you have multiple TCS3200 you may tie all the pins together except the outputs (pinC). Then just use detectColor(TCS3200's output) to
13 detect color on the selected TCS3200's output pin.
14
15 7/6/2011 works on arduino 0022
16
17 Taos pins connect to arduino pins 8-13. There is no order and should work on any digital i/o
18 */
19 int S0 = 8; //pinB
20 int S1 = 9; //pinA
21 int S2 = 12; //pinE
22 int S3 = 11; //pinF
23 int out = 10; //pinC
24 int LED = 13; //pinD
25
26
27 void setup() {
28
29     TCS3200setup();
30
31     Serial.begin(115200);
32     Serial.print("\n\n\nready\n\n\n");
33     delay(100);
34 }
35
36
37 void loop() {
38
39     Serial.print(detectColor(out));
40
41     Serial.print("\n\n\n");
42
43     delay(1000);
44 }
45
46
47 int detectColor(int taosOutPin){
48
49     //isPresentTolerance will need to be something small if used in high light environment, large if used in dark environment.
50     //the color detection will work either way, but the larger isPresentTolerance is, the closer the object will need to be in front of sensor
51
52     double isPresentTolerance = 5;
53     double isPresent = colorRead(taosOutPin, 0, 0)/colorRead(taosOutPin, 0, 1); //number gets large when something is in front of sensor.
54
55     Serial.print("isPresent: ");
56     Serial.println(isPresent, 2);
57     Serial.print("isPresentTolerance currently set to:");
58     Serial.println(isPresentTolerance, 2);
59
60
61     if(isPresent < isPresentTolerance){
62         Serial.println("nothing is in front of sensor");

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63     return 0;
64 }
65
66
67 double red, blue, green;
68 double white = colorRead(taosOutPin, 0, 1);
69
70 red = white/colorRead(taosOutPin, 1, 1);
71 blue = white/colorRead(taosOutPin, 2, 1);
72 green = white/colorRead(taosOutPin, 3, 1);
73
74 Serial.print("red");
75 Serial.println(red);
76
77 Serial.print("blue");
78 Serial.println(blue);
79
80 Serial.print("green");
81 Serial.println(green);
82
83 if(red > blue && red > green){
84     Serial.println("red is in front");
85     return 1;
86 }
87
88 if(blue > green && blue > red){
89     Serial.println("blue is in front");
90     return 2;
91 }
92
93 if(green > blue && green > red){
94     Serial.println("green is in front");
95     return 3;
96 }
97
98
99 }
100
101
102
103 /*
104 This method will return the pulseIn reading of the selected color.
105
106 Since frequency is proportional to light intensity of the selected color filter,
107 the smaller pulseIn is, the more light there is of the selected color filter.
108
109 It will turn on the sensor at the start taosMode(1), and it will power off the sensor at the end taosMode(0)
110
111 color: 0=white, 1=red, 2=blue, 3=green
112
113 if LEDstate is 0, LED will be off. 1 and the LED will be on.
114
115 taosOutPin is the output of the TCS3200. If you have multiple TCS3200, all wires can be combined except the output pin
116 */
117
118
119 double colorRead(int taosOutPin, int color, boolean LEDstate){
120
121     //make sure that the pin is set to input
122     pinMode(taosOutPin, INPUT);
123
124     //turn on sensor with highest frequency setting

```

```

125 taosMode(1);
126
127 //delay to let the sensor sit before taking a reading. Should be very small with this sensor
128 int sensorDelay = 1;
129
130 //set the pins to select the color
131 if(color == 0){//white
132     digitalWrite(S3, LOW); //S3
133     digitalWrite(S2, HIGH); //S2
134     // Serial.print(" w");
135 }else if(color == 1){//red
136     digitalWrite(S3, LOW); //S3
137     digitalWrite(S2, LOW); //S2
138     // Serial.print(" r");
139 }else if(color == 2){//blue
140     digitalWrite(S3, HIGH); //S3
141     digitalWrite(S2, LOW); //S2
142     // Serial.print(" b");
143 }else if(color == 3){//green
144     digitalWrite(S3, HIGH); //S3
145     digitalWrite(S2, HIGH); //S2
146     // Serial.print(" g");
147 }
148
149 double readPulse;
150
151 if(LEDstate == 0){
152     digitalWrite(LED, LOW);
153 }
154
155 if(LEDstate == 1){
156     digitalWrite(LED, HIGH);
157 }
158
159 delay(sensorDelay);
160
161 readPulse = pulseIn(taosOutPin, LOW, 80000);
162
163 //if the pulseIn times out, it returns 0 and that throws off numbers. just cap it at 80k if it happens
164 if(readPulse < .1){
165     readPulse = 80000;
166 }
167
168 //turn off color sensor and white LED to save power
169 taosMode(0);
170
171 return readPulse;
172 }
173
174
175 //setting mode to zero will put taos into low power mode. taosMode(0);
176 void taosMode(int mode){
177
178     if(mode == 0){
179         //power OFF
180         digitalWrite(LED, LOW);
181         digitalWrite(S0, LOW); //S0
182         digitalWrite(S1, LOW); //S1
183         // Serial.println("mOFFm");
184     }else if(mode == 1){
185         //this will put in 1:1
186         digitalWrite(S0, HIGH); //S0

```

```
187     di gi tal Wri te(S1, HI GH); //S1
188     // Serial .println("m1: 1m");
189 }else i f(mode == 2){
190     //this will put in 1: 5
191     di gi tal Wri te(S0, HI GH); //S0
192     di gi tal Wri te(S1, LOW); //S1
193     //Serial .println("m1: 5m");
194 }else i f(mode == 3){
195     //this will put in 1: 50
196     di gi tal Wri te(S0, LOW); //S0
197     di gi tal Wri te(S1, HI GH); //S1
198     //Serial .println("m1: 50m");
199 }
200 return;
201 }
202
203
204 void TCS3200setup(){
205     //i ni ti a li ze pi ns
206     pi nMode(LED, OUTPUT); //LED pi nD
207     //col or mode sel ecti on
208     pi nMode(S2, OUTPUT); //S2 pi nE
209     pi nMode(S3, OUTPUT); //s3 pi nF
210
211     //col or response pi n (only actual i nput from taos)
212     //pi nMode(out, I NPUT); //out pi nC
213
214     //communi cati on freq output di vi der
215     pi nMode(S0, OUTPUT); //S0 pi nB
216     pi nMode(S1, OUTPUT); //S1 pi nA
217
218     return;
219 }
220
221
222
```