

/*****

This is a sketch for a Time Lapse Camera project

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Functions implemented:

1. Photo Capture at a specific speed
2. Upload photos to a web server
3. Could switch between two photo capture rates: 30s/photo and 1min/photo
4. Four light colors to signal users of current status:

Red--Initializing

Blue--Photo uploading

Green--Waiting status of 30s interval

Yellow--Waiting status of 1min interval

Components:

1. a VC0706 TTL Serial Camera
2. an Adafruit CC3000 Wi-Fi breakout board
3. an Arduino board
4. a RGB LED
5. a button
6. resistors,jumper wires and battery

*****/

#include <Adafruit_VC0706.h>

#include <SoftwareSerial.h>

```
#include <Adafruit_CC3000.h>
```

```
#include <ccspi.h>
```

```
#include <SPI.h>
```

```
#include <string.h>
```

```
#include "utility/debug.h"
```

```
#include<stdlib.h>
```

```
//Interrupt invoke by pressing the button
```

```
int redPin = 10;
```

```
int greenPin = 9;
```

```
int bluePin = 8;
```

```
volatile boolean state = false;
```

```
int32_t interval1 = 30000;//30s
```

```
int32_t interval2 = 60000;//1min
```

```
int32_t waitingTime = interval1;
```

```
// VC0706 Camera connection Software serial
```

```
SoftwareSerial cameraconnection = SoftwareSerial(7, 4);
```

```
Adafruit_VC0706 cam = Adafruit_VC0706(&cameraconnection);
```

```

// Define CC3000 chip pins

#define ADAFRUIT_CC3000_IRQ 3

#define ADAFRUIT_CC3000_VBAT 5

#define ADAFRUIT_CC3000_CS 6


// WiFi network (change with your settings !)


#define WLAN_SSID "Your network"

#define WLAN_PASS "Password"

// Security can be WLAN_SEC_UNSEC, WLAN_SEC_WEP, WLAN_SEC_WPA or WLAN_SEC_WPA2

#define WLAN_SECURITY WLAN_SEC_WPA2


// Create CC3000 instances

Adafruit_CC3000 cc3000 = Adafruit_CC3000(ADAFRUIT_CC3000_CS, ADAFRUIT_CC3000_IRQ,
ADAFRUIT_CC3000_VBAT,

SPI_CLOCK_DIV2);


uint32_t ip = cc3000.IP2U32(198,0,0,1)//input your web server IP address

int port = 80;


char filename[14] = "IMAGE000.JPG";

int i = 0;

Adafruit_CC3000_Client client;

```

```
void setup() {

  Serial.begin(115200);

  setColor(255, 0, 0); //Red--Initializing

  //Set up button interrupt
  attachInterrupt(0, changeRate, FALLING);

  Serial.println("Camera test");

  // Try to locate the camera
  if (cam.begin()) {
    Serial.println("Camera found:");
  } else {
    Serial.println("Camera not found !");
    return;
  }

  // Set picture size, could change to other sizes
  cam.setImageSize(VC0706_640x480);

  // Initialise the module
  Serial.println(F("\nInitializing..."));
  if (!cc3000.begin())
  {
```

```
Serial.println(F("Couldn't begin()! Check your wiring?"));

while(1);

}


// Connect to WiFi network

cc3000.connectToAP(WLAN_SSID, WLAN_PASS, WLAN_SECURITY);

Serial.println(F("Connected!"));


// Display connection details

Serial.println(F("Request DHCP"));

while (!cc3000.checkDHCP())

{

    delay(100);

}


Serial.println("Ready");

setColor(0,0, 255); // gGreen--Waiting

delay(3000);


}
```

```
void loop() {

    if (! cam.takePicture()){

        Serial.println("Failed to snap!");

    }

    else {

        Serial.println("Picture taken!");

        setColor(255,255,0);//purple--snap!

        delay(100);

    }


    //calculate uploading time

    int32_t time = millis();


    // Get the size of the image (frame) taken

    uint16_t jpglen = cam.frameLength();

    filename[5] = '0' + i/100;

    filename[6] = '0' + i%100/10;

    filename[7] = '0' + i%100%10;


    // Prepare HTTP request

    String start_request = "";

    String end_request = "";
```

```
start_request = start_request + "\n" + "--AaB03x" + "\n" + "Content-Disposition: form-data;  
name=\"file\"; filename="+filename+"\n" + "Content-Type: image/jpeg" + "\n" + "Content-  
Transfer-Encoding: binary" + "\n" + "\n";
```

```
end_request = end_request + "\n" + "--AaB03x--" + "\n";
```

```
uint16_t extra_length;
```

```
extra_length = start_request.length() + end_request.length();
```

```
uint16_t len = jpglen + extra_length;
```

```
// Set up TCP connection with web server
```

```
client = cc3000.connectTCP(ip, port);
```

```
if (client.connected()) {
```

```
    Serial.println("Start uploading...");
```

```
    setColor(0, 255, 0); //blue--Photo Uploading
```

```
    client.println(F("POST /camera.php HTTP/1.1"));
```

```
    client.println(F("Host: 198.0.0.1:80")); //HTTP port 80
```

```
    client.println(F("Content-Type: multipart/form-data; boundary=AaB03x"));
```

```
    client.print(F("Content-Length: "));
```

```
    client.println(len);
```

```
    client.print(start_request);
```

```
// Send binary data
```

```
byte wCount = 0;
```

```
while (jpglen > 0) {
```

```
uint8_t *buffer;

uint8_t bytesToRead = min(32, jpglen);

buffer = cam.readPicture(bytesToRead);

client.write(buffer, bytesToRead);

jpglen -= bytesToRead;
}

client.print(end_request);

client.println();

}

else{

    Serial.println("Web server connection failed");

}

client.close();

Serial.println("done...");

time = millis() - time;

Serial.print(time); Serial.println(" ms elapsed");
```

```
i++;

cam.resumeVideo();


if(state){

    setColor(255, 0,165);//orange--Waiting for 1min interval

    waitingTime = interval2;

}

else{

    setColor(0, 0, 255); // green--Waiting for 30s interval

    waitingTime = interval1;

}


delay(waitingTime - time);

}


//Invoke when button pressed

void changeRate(){

    state = !state;

    Serial.println(state);
```

```
}
```

```
//Set color of RGB LED
```

```
void setColor(int red, int green, int blue)
```

```
{
```

```
    #ifdef COMMON_ANODE
```

```
        red = 255 - red;
```

```
        green = 255 - green;
```

```
        blue = 255 - blue;
```

```
    #endif
```

```
    analogWrite(redPin, red);
```

```
    analogWrite(greenPin, green);
```

```
    analogWrite(bluePin, blue);
```

```
}
```