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// File: esp32_camera.ino

#include "esp_camera.h"
#include <WiFi.h>

// Uncomment the camera model you are using
#define CAMERA_MODEL_WROVER_KIT
//#define CAMERA_MODEL_ESP_EYE
//#define CAMERA_MODEL_ESP32S3_EYE
//#define CAMERA_MODEL_M5STACK_PSRAM
//#define CAMERA_MODEL_M5STACK_V2_PSRAM
//#define CAMERA_MODEL_M5STACK_WIDE
//#define CAMERA_MODEL_M5STACK_ESP32CAM
//#define CAMERA_MODEL_M5STACK_UNITCAM
//#define CAMERA_MODEL_AI_THINKER
//#define CAMERA_MODEL_TTGO_T_JOURNAL
//#define CAMERA_MODEL_XIAO_ESP32S3
//#define CAMERA_MODEL_ESP32_CAM_BOARD
//#define CAMERA_MODEL_ESP32S2_CAM_BOARD
//#define CAMERA_MODEL_ESP32S3_CAM_LCD
//#define CAMERA_MODEL_DFRobot_FireBeetle2_ESP32S3
//#define CAMERA_MODEL_DFRobot_Romeo_ESP32S3

#include "camera_pins.h"

const char* ssid = "YOUR_SSID";
const char* password = "YOUR_PASSWORD";

void startCameraServer();
void setupLedFlash(int pin);

void setup() {
  Serial.begin(115200);
  Serial.setDebugOutput(true);
  Serial.println();

  camera_config_t config;
  config.ledc_channel = LEDC_CHANNEL_0;
  config.ledc_timer = LEDC_TIMER_0;
  config.pin_d0 = Y2_GPIO_NUM;
  config.pin_d1 = Y3_GPIO_NUM;
  config.pin_d2 = Y4_GPIO_NUM;
  config.pin_d3 = Y5_GPIO_NUM;
  config.pin_d4 = Y6_GPIO_NUM;
  config.pin_d5 = Y7_GPIO_NUM;
  config.pin_d6 = Y8_GPIO_NUM;
  config.pin_d7 = Y9_GPIO_NUM;
  config.pin_xclk = XCLK_GPIO_NUM;
  config.pin_pclk = PCLK_GPIO_NUM;
  config.pin_vsync = VSYNC_GPIO_NUM;
  config.pin_href = HREF_GPIO_NUM;
  config.pin_sccb_sda = SIOD_GPIO_NUM;
config.pin_sccb_scl = SIOC_GPIO_NUM;
config.pin_pwdn = PWDN_GPIO_NUM;
config.pin_reset = RESET_GPIO_NUM;
config.xclk_freq_hz = 20000000;
config.frame_size = FRAMESIZE_UXGA;
config.pixel_format = PIXFORMAT_JPEG;
config.grab_mode = CAMERA_GRAB_WHEN_EMPTY;
config.fb_location = CAMERA_FB_IN_PSRAM;
config.jpeg_quality = 12;
config.fb_count = 1;

if (config.pixel_format == PIXFORMAT_JPEG) {
  if (psramFound()) {
    config.jpeg_quality = 10;
    config.fb_count = 2;
    config.grab_mode = CAMERA_GRAB_LATEST;
  } else {
    config.frame_size = FRAMESIZE_SVGA;
    config.fb_location = CAMERA_FB_IN_DRAM;
  }
} else {
  config.frame_size = FRAMESIZE_240X240;
  #if CONFIG_IDF_TARGET_ESP32S3
    config.fb_count = 2;
  #endif
}

#if defined(CAMERA_MODEL_ESP_EYE)
  pinMode(13, INPUT_PULLUP);
  pinMode(14, INPUT_PULLUP);
#endif

esp_err_t err = esp_camera_init(&config);
if (err != ESP_OK) {
  Serial.printf("Camera init failed with error 0x%x", err);
  return;
}

sensor_t * s = esp_camera_sensor_get();
if (s->id.PID == OV3660_PID) {
  s->set_vflip(s, 1);
  s->set_brightness(s, 1);
  s->set_saturation(s, -2);
}

if (config.pixel_format == PIXFORMAT_JPEG) {
  s->set_framesize(s, FRAMESIZE_QVGA);
}

#if defined(CAMERA_MODEL_M5STACK_WIDE) || defined(CAMERA_MODEL_M5STACK_ESP32CAM)
  s->set_vflip(s, 1);
  s->set_hmirror(s, 1);
#endif
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  #if defined(CAMERA_MODEL_ESP32S3_EYE)
    s->set_vflip(s, 1);
  #endif

  setupLedFlash(LED_GPIO_NUM);

  WiFi.begin(ssid, password);
  WiFi.setSleep(false);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }

  Serial.println("");
  Serial.println("WiFi connected");

  startCameraServer();
  Serial.print("Camera Ready! Use 'http://");
  Serial.print(WiFi.localIP());
  Serial.println("' to connect");
}

void loop() {
  delay(10000);
}
```