

```

#define ASC2_12

#include "asr.h"
extern "C" { void * __dso_handle = 0 ;}
#include "setup.h"
#include "myLib/asr_event.h"
#include "HardwareSerial.h"
#include "myLib/asr_servo.h"
#include "myLib/asr_sh1106.h"
#include "asr_math.h"

uint32_t snid;
uint8_t time = 0;
uint8_t _E8_BF_90_E5_8A_A8 = 0;
uint8_t flag = 0;
uint8_t emotion = 0;
Servo servo_5;
Servo servo_1;
Servo servo_6;
Servo servo_0;
QueueHandle_t asr_code_handler_msg=NULL;
void asr_code_handler_app();
void app();
void _E5_89_8D_E8_BF_9B();
void _E5_8F_B3_E8_BD_AC();
Servo servo_3;
void _E5_90_8E_E9_80_80();
void _E5_B7_A6_E8_BD_AC();
void _E6_91_87_E6_91_86();
void _E8_83_8C_E8_AF_B5_E6_A0_A1_E8_AE_AD();
void song();
void ASR_CODE();
void _E7_AB_8B_E6_AD_A3();
void _E8_B6_B4_E4_B8_8B();
void _E6_8F_A1_E6_89_8B();

//{speak: 小萌 - 可爱女童 ,vol:10,speed:8,platform:haohaodada}
//{playid:10001,voice;}
//{playid:10002,voice;}

SH1106 sh1106(128,64,2,3);
void asr_code_handler_app(){
    uint16_t asr_code_handler_snid;
    while (1) {
        if(xQueueReceive(asr_code_handler_msg,&asr_code_handler_snid,0)){
            switch (asr_code_handler_snid) {
                case 0:
                    Serial.println("start");
                    break;
                case 6:

```

```

    while (!((snid) != 6)) {
        _E5_89_8D_E8_BF_9B();
    }
    break;
case 7:
    while (!((snid) != 7)) {
        _E5_90_8E_E9_80_80();
    }
    break;
case 12:
    vol_set(2);
    break;
case 8:
    while (!((snid) != 8)) {
        _E5_B7_A6_E8_BD_AC();
    }
    break;
case 9:
    while (!((snid) != 9)) {
        _E5_8F_B3_E8_BD_AC();
    }
    break;
case 10:
    while (!((snid) != 10)) {
        _E6_91_87_E6_91_86();
    }
    break;
case 11:
    _E8_83_8C_E8_AF_B5_E6_A0_A1_E8_AE_AD();
    break;
case 13:
    vol_set(4);
    break;
case 21:
    song();
    break;
case 14:
    vol_set(6);
    break;
case 20:
    while (!(((snid) == 0) || (time >= 5))) {
        flag = random(1, 8+1);
        switch (flag) {
            case 1:
                _E7_AB_8B_E6_AD_A3();
                break;
            case 2:
                _E8_B6_B4_E4_B8_8B();
                break;
            case 3:

```

```

        _E5_8F_B3_E8_BD_AC();
        _E5_8F_B3_E8_BD_AC();
        break;
    case 4:
        _E6_8F_A1_E6_89_8B();
        break;
    case 5:
        _E5_89_8D_E8_BF_9B();
        _E5_89_8D_E8_BF_9B();
        _E5_89_8D_E8_BF_9B();
        _E5_89_8D_E8_BF_9B();
        break;
    case 6:
        _E6_91_87_E6_91_86();
        _E6_91_87_E6_91_86();
        _E6_91_87_E6_91_86();
        _E6_91_87_E6_91_86();
        break;
    case 7:
        _E5_90_8E_E9_80_80();
        _E5_90_8E_E9_80_80();
        break;
    case 8:
        _E5_B7_A6_E8_BD_AC();
        _E5_B7_A6_E8_BD_AC();
        break;
    }
    delay((random(300000, 600000+1)));
    flag = 0;
    time = time + 1;
}
delay(3600000);
//{playid:10500,voice:笨笨有点困了，睡一会 }
play_audio(10500);
_E8_B6_B4_E4_B8_8B();
break;
case 5:
    while (!((snid) != 5)) {
        _E6_8F_A1_E6_89_8B();
    }
    break;
}
}
delay(1);
}
vTaskDelete(NULL);
}

void app(){
    while (emotion == 0) {

```

```
const unsigned char  
face1[351]={0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0xFF,0x00,0x00,0x00,0x03,0xFE,0x00,0x00,0x00,0x00,0x00,0x00,0x0F,0xFF,0x00,0x00,  
    0x00,0x03,0xFF,0xC0,0x00,0x0F,0x8E,0x00,0x00,0x1F,0xFF,0x00,0x00,0x00,0x03,0xFF,  
    0xE0,0x00,0x1F,0xFF,0x80,0x00,0x1E,0x00,0x00,0x00,0x00,0x00,0x01,0xE0,0x00,0x1F,  
    0xFF,0xC0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x3F,0xFF,0xC0,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x3F,0xFF,0xC0,0x00,0x00,0x00,0x00,  
    0x0F,0xC0,0x00,0x00,0x00,0x00,0x3F,0xFF,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x1F,0xFF,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x1F,0xFF,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x0F,0xFF,0x00,  
    0x01,0x98,0x00,0x00,0x00,0x00,0x00,0x00,0x66,0x00,0x07,0xFC,0x00,0x01,0x98,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x66,0x00,0x3F,0xF8,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0xFF,0xE0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x07,0xF1,0xE0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x27,0x80,0xC0,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0xC2,0x03,0xC0,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x07,0x80,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,}};  
  
shl106.show_picture(14,18,100,27,face1);  
  
shl106.display();  
  
delay(250);  
  
const unsigned char  
face2[351]={0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x03,0xF8,0x00,0x00,0x00,0x00,0x7F,0x00,0x00,0x00,  
    0x00,0x07,0xFC,0x00,0x00,0x00,0x00,0xFF,0xC0,0x00,0x00,0x00,0x00,0x0F,0xFF,0x00,0x00,  
    0x00,0x00,0x00,0x03,0xFF,0xC0,0x00,0x00,0x00,0x00,0x00,0x1F,0xFF,0x00,0x00,  
    0x00,0x03,0xFF,0xE0,0x00,0x00,0x00,0x00,0x00,0x1F,0xFF,0x00,0x00,0x00,0x03,0xFF,  
    0xE0,0x00,0x1F,0x9F,0x00,0x00,0x1F,0xFF,0x00,0x00,0x00,0x03,0xFF,0xE0,0x00,0x3F,  
    0xFF,0x80,0x00,0x1F,0xFF,0x00,0x00,0x00,0x03,0xFF,0xE0,0x00,0x3F,0xFF,0x80,0x00,  
    0x1F,0xFE,0x00,0x00,0x00,0x01,0xFF,0xC0,0x00,0x7F,0xFF,0x80,0x00,0x0F,0xFC,0x00,  
    0x00,0x00,0x00,0xFF,0xC0,0x00,0x3F,0xFF,0x80,0x00,0x03,0xF0,0x00,0x0F,0x80,0x00,  
    0x7F,0x00,0x00,0x7F,0xFF,0x80,0x00,0x00,0x00,0x00,0x03,0x80,0x00,0x00,0x00,0x00,  
    0x3F,0xFF,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x1F,0xFF,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x0F,0xFE,0x00,0x01,0xB0,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x36,0x00,0x07,0xF8,0x00,0x01,0xB0,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x36,0x00,0x3F,0xF0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x01,0xFF,0xE0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x27,0xE1,0xC0,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x47,0x81,0xC0,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x01,0x06,0x07,0x80,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x0F,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,}};  
  
shl106.show_picture(14,18,100,27,face2);
```

```

sh1106.display();
delay(250);
const unsigned char face3[351]={
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x01,0xFF,0x00,0x00,0x00,0xFC,0x00,0x00,0x00,0x00,
0x00,0x00,0x03,0xFE,0x00,0x00,0x00,0x01,0xFF,0x00,0x00,0x00,0x00,0x00,0x00,0x07,
0xFF,0x00,0x00,0x00,0x03,0xFF,0x00,0x00,0x00,0x00,0x00,0x00,0x0F,0xFF,0x00,0x00,
0x00,0x07,0xFF,0x80,0x00,0x00,0x00,0x00,0x00,0x0F,0xFF,0x00,0x00,0x00,0x07,0xFF,
0xC0,0x00,0x7C,0x60,0x00,0x00,0x0F,0xFF,0x00,0x00,0x00,0x07,0xFF,0xC0,0x00,0xFF,
0xF8,0x00,0x00,0x0F,0xFF,0x00,0x00,0x00,0x07,0xFF,0x80,0x00,0xFF,0xFC,0x00,0x00,
0x0F,0xFF,0x00,0x00,0x00,0x07,0xFF,0x80,0x01,0xFF,0xFE,0x00,0x00,0x0F,0xFE,0x00,
0x00,0x00,0x03,0xFF,0x80,0x01,0xFF,0xFE,0x00,0x00,0x07,0xFC,0x00,0x0F,0x80,0x01,
0xFF,0x00,0x00,0xFF,0xFC,0x00,0x00,0x03,0xF8,0x00,0x00,0x00,0x7C,0x00,0x00,
0xFF,0xFC,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x7F,0xF8,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x7F,0xF0,0x00,0x01,0x98,0x00,
0x00,0x00,0x00,0x00,0x00,0xCC,0x00,0xFF,0xC0,0x00,0x01,0x98,0x00,0x00,0x00,0x00,
0x00,0x00,0xCC,0x03,0xFF,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x1F,0x8E,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x3C,0x06,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x3C,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,};
sh1106.show_picture(14,18,100,27,face3);
sh1106.display();
delay(5000);
delay(2);
}
vTaskDelete(NULL);
}

/*描述该功能 ...
*/
void _E5_89_8D_E8_BF_9B(){
servo_5.write(30);
servo_1.write(90);
servo_6.write(90);
servo_0.write(150);
delay(100);
servo_5.write(30);
servo_1.write(30);
servo_6.write(150);
servo_0.write(150);
delay(100);
servo_5.write(90);
servo_1.write(30);
servo_6.write(150);
servo_0.write(90);

```

```
delay(100);
servo_5.write(90);
servo_1.write(90);
servo_6.write(90);
servo_0.write(90);
delay(100);
servo_5.write(90);
servo_1.write(150);
servo_6.write(30);
servo_0.write(90);
delay(100);
servo_5.write(150);
servo_1.write(150);
servo_6.write(30);
servo_0.write(30);
delay(100);
servo_5.write(150);
servo_1.write(90);
servo_6.write(90);
servo_0.write(30);
delay(100);
servo_5.write(90);
servo_1.write(90);
servo_6.write(90);
servo_0.write(90);
delay(100);
}

/* 描述该功能 ...
*/

void _E5_8F_B3_E8_BD_AC(){
    servo_5.write(90);
    servo_1.write(30);
    servo_6.write(30);
    servo_0.write(90);
    delay(100);
    servo_5.write(150);
    servo_1.write(30);
    servo_6.write(30);
    servo_0.write(150);
    delay(100);
    servo_5.write(150);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(150);
    delay(100);
    servo_5.write(90);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(90);
```

```
        delay(100);
    }

/* 描述该功能 ...
*/
void _E5_90_8E_E9_80_80(){
    servo_5.write(90);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(90);
    delay(100);
    servo_5.write(150);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(30);
    delay(100);
    servo_5.write(150);
    servo_1.write(150);
    servo_6.write(60);
    servo_0.write(60);
    delay(100);
    servo_5.write(90);
    servo_1.write(150);
    servo_6.write(30);
    servo_0.write(30);
    delay(100);
    servo_5.write(90);
    servo_1.write(90);
    servo_3.write(90);
    servo_0.write(90);
    delay(100);
    servo_5.write(90);
    servo_1.write(30);
    servo_6.write(150);
    servo_0.write(90);
    delay(100);
    servo_5.write(30);
    servo_1.write(30);
    servo_6.write(150);
    servo_0.write(150);
    delay(100);
    servo_5.write(30);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(150);
    delay(100);
}

/* 描述该功能 ...
*/
```

```
void _E5_B7_A6_E8_BD_AC(){
    servo_5.write(90);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(90);
    delay(100);
    servo_5.write(150);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(150);
    delay(100);
    servo_5.write(150);
    servo_1.write(30);
    servo_6.write(30);
    servo_0.write(150);
    delay(100);
    servo_5.write(90);
    servo_1.write(30);
    servo_6.write(30);
    servo_0.write(90);
    delay(100);
}

/* 描述该功能 ...
*/

void _E6_91_87_E6_91_86(){
    servo_5.write(60);
    servo_1.write(120);
    servo_6.write(60);
    servo_0.write(120);
    delay(100);
    servo_5.write(120);
    servo_1.write(60);
    servo_6.write(120);
    servo_0.write(60);
    delay(100);
}

/* 描述该功能 ...
*/

void _E8_83_8C_E8_AF_B5_E6_A0_A1_E8_AE_AD(){
    servo_5.write(0);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(90);
    delay(1000);
    servo_5.write(90);
    servo_1.write(180);
    servo_6.write(90);
    servo_0.write(90);
}
```



```
//{playid:10501,voice:上理同学大家好 }
play_audio(10501);
}
```

```
/* 描述该功能 ...
```

```
*/
```

```
void song(){
    servo_5.write(180);
    servo_1.write(0);
    servo_6.write(180);
    servo_0.write(0);
    //{playid:10502,voice:举头望明月 }
    play_audio(10502);
    delay(1000);
    servo_5.write(0);
    servo_1.write(180);
    servo_6.write(90);
    servo_0.write(90);
    //{playid:10503,voice:低头思故乡 }
    play_audio(10503);
}
```

```
/* 描述该功能 ...
```

```
*/
```

```
void ASR_CODE(){
    switch (snid) {
        case 1:
            delay(100);
            servo_5.write(90);
            servo_1.write(90);
            servo_6.write(90);
            servo_0.write(90);
            _E8_BF_90_E5_8A_A8 = 0;
            time = 0;
            break;
        case 2:
            delay(100);
            servo_5.write(0);
            servo_1.write(180);
            servo_6.write(0);
            servo_0.write(180);
            _E8_BF_90_E5_8A_A8 = 0;
            break;
        case 3:
            delay(100);
            servo_5.write(90);
            servo_1.write(90);
            servo_6.write(0);
            servo_0.write(180);
            _E8_BF_90_E5_8A_A8 = 0;
```

```

    break;
case 4:
    delay(100);
    servo_5.write(0);
    servo_1.write(180);
    servo_6.write(90);
    servo_0.write(90);
    _E8_BF_90_E5_8A_A8 = 0;
    break;
case 5:
    _E8_BF_90_E5_8A_A8 = 0;
    break;
case 6:
    _E8_BF_90_E5_8A_A8 = 6;
    break;
case 7:
    _E8_BF_90_E5_8A_A8 = 7;
    break;
case 8:
    _E8_BF_90_E5_8A_A8 = 8;
    break;
case 9:
    _E8_BF_90_E5_8A_A8 = 9;
    break;
case 10:
    _E8_BF_90_E5_8A_A8 = 10;
    break;
}
if(snid == 0){
    xQueueSend(asr_code_handler_msg,&snid,0);
}
if(snid == 6){
    xQueueSend(asr_code_handler_msg,&snid,0);
}
if(snid == 7){
    xQueueSend(asr_code_handler_msg,&snid,0);
}
if(snid == 12){
    xQueueSend(asr_code_handler_msg,&snid,0);
}
if(snid == 8){
    xQueueSend(asr_code_handler_msg,&snid,0);
}
if(snid == 9){
    xQueueSend(asr_code_handler_msg,&snid,0);
}
if(snid == 10){
    xQueueSend(asr_code_handler_msg,&snid,0);
}
if(snid == 11){

```

[illegible]

[illegible]

[illegible]

```

    delay(200);
    sh1106.show_picture(33.5,0,61,64,face6);
    sh1106.display();
    delay(200);
    sh1106.show_picture(33.5,0,61,64,face7);
    sh1106.display();
    delay(1000);
    emotion = 0;
    delay(500);
    _E5_89_8D_E8_BF_9B();
    _E5_89_8D_E8_BF_9B();
    _E5_89_8D_E8_BF_9B();
    _E5_89_8D_E8_BF_9B();
    delay(1000);
}

if(snid == 20){
    xQueueSend(asr_code_handler_msg,&snid,0);
}
if(snid == 5){
    xQueueSend(asr_code_handler_msg,&snid,0);
}
if((snid) == 15){
    servo_5.write(180);
    servo_1.write(0);
    servo_6.write(180);
    servo_0.write(0);
}
}

/* 描述该功能 ...
*/
void _E7_AB_8B_E6_AD_A3(){
    servo_5.write(90);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(90);
}

/* 描述该功能 ...
*/
void _E8_B6_B4_E4_B8_8B(){
    servo_5.write(0);
    servo_1.write(180);
    servo_6.write(0);
    servo_0.write(180);
}

/* 描述该功能 ...
*/

```

```

void _E6_8F_A1_E6_89_8B(){
    delay(100);
    servo_5.write(0);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(90);
    delay(100);
    servo_5.write(15);
}

void hardware_init(){
    asr_code_handler_msg=xQueueCreate(5,4);
    vol_set(1);
    xTaskCreate(app,"app",128,NULL,4,NULL);
    vTaskDelete(NULL);
}

void setup()
{
    servo_5.attach(5);
    servo_1.attach(1);
    servo_6.attach(6);
    servo_0.attach(0);
    //{ID:0,keyword:" 唤醒词 ",ASR:" 小笨 ",ASRTO:" 笨笨来了"}
    set_wakeup_forever();
    setPinFun(13,SECOND_FUNCTION);
    setPinFun(14,SECOND_FUNCTION);
    Serial.begin(115200);
    //{ID:1,keyword:" 命令词 ",ASR:" 立正 ",ASRTO:" 好滴"}
    //{ID:2,keyword:" 命令词 ",ASR:" 趴下 ",ASRTO:" 趴下啦"}
    //{ID:15,keyword:" 命令词 ",ASR:" 后趴 ",ASRTO:" 有骨头吗"}
    //{ID:3,keyword:" 命令词 ",ASR:" 蹲下 ",ASRTO:" 好的"}
    //{ID:4,keyword:" 命令词 ",ASR:" 低头 ",ASRTO:" 低下看看有没有钱"}
    //{ID:5,keyword:" 命令词 ",ASR:" 握手 ",ASRTO:" 你好"}
    //{ID:6,keyword:" 命令词 ",ASR:" 前进 ",ASRTO:" 笨笨前进"}
    //{ID:7,keyword:" 命令词 ",ASR:" 后退 ",ASRTO:" 倒车请注意"}
    //{ID:8,keyword:" 命令词 ",ASR:" 左转 ",ASRTO:" 转转转"}
    //{ID:9,keyword:" 命令词 ",ASR:" 右转 ",ASRTO:" 诶嘿诶嘿"}
    //{ID:10,keyword:" 命令词 ",ASR:" 摇摆 ",ASRTO:" 嘿咻嘿咻"}
    //{ID:11,keyword:" 命令词 ",ASR:" 背诵校训 ",ASRTO:" 信义勤爱, 思学致远"}
    //{ID:12,keyword:" 命令词 ",ASR:" 最小音量 ",ASRTO:" 音量已调整为最小"}
    //{ID:13,keyword:" 命令词 ",ASR:" 中等音量 ",ASRTO:" 音量已调整为中等"}
    //{ID:14,keyword:" 命令词 ",ASR:" 最大音量 ",ASRTO:" 音量已调整为最大"}
    //{ID:20,keyword:" 命令词 ",ASR:" 随便玩 ",ASRTO:" 哦"}
    //{ID:21,keyword:" 命令词 ",ASR:" 背诵静夜思 ",ASRTO:" 床前明月光, 疑是地上霜"}
    //{ID:22,keyword:" 命令词 ",ASR:" 撒娇 ",ASRTO:" 笨笨生病了, 要主人亲亲才能好"}
    //{ID:23,keyword:" 命令词 ",ASR:" 亲亲 ",ASRTO:" 笨笨爱你"}
    servo_5.write(0);
    servo_1.write(180);
    servo_6.write(0);

```

```

servo_0.write(180);
sh1106.begin(0x3c);
sh1106.clear((0));
sh1106.set_text_color((1),(1));
xTaskCreate(asr_code_handler_app,"asr_code_handler_app",256,NULL,4,NULL);
servo_3.attach(3);
}

#define ASC2_12

#include "asr.h"
extern "C">{ void * __dso_handle = 0 ;}
#include "setup.h"
#include "myLib/asr_event.h"
#include "HardwareSerial.h"
#include "myLib/asr_servo.h"
#include "myLib/asr_sh1106.h"
#include "asr_math.h"

uint32_t snid;
uint8_t time = 0;
uint8_t _E8_BF_90_E5_8A_A8 = 0;
uint8_t flag = 0;
uint8_t emotion = 0;
uint8_t battery_level = 100;
uint8_t dance_mode = 0;
uint16_t step_count = 0;
unsigned long last_activity_time = 0;
bool sleep_mode = false;

Servo servo_5;
Servo servo_1;
Servo servo_6;
Servo servo_0;
Servo servo_3;
Servo servo_2;

QueueHandle_t asr_code_handler_msg=NULL;

// 表情数据
const unsigned char happy_face[512] = { /* 快乐表情数据 */ };
const unsigned char sad_face[512] = { /* 悲伤表情数据 */ };
const unsigned char angry_face[512] = { /* 生气表情数据 */ };
const unsigned char surprised_face[512] = { /* 惊讶表情数据 */ };

// 新增功能函数声明
void battery_check();
void auto_sleep();
void wake_up();
void show_battery_status();

```



```

void dance_routine1();
void dance_routine2();
void exercise_mode();
void follow_mode();
void obstacle_avoidance();
void tracking_mode();
void show_emotion(uint8_t emotion_type);
void led_effect(uint8_t pattern);
void sound_effect(uint8_t type);
void calculate_battery();
void save_step_count();
void reset_step_count();
void show_statistics();
void security_mode();
void patrol_mode();
void interactive_mode();
void learning_mode();
void voice_feedback(uint16_t feedback_id);
void gesture_recognition();
void remote_control();
void data_logging();
void system_diagnostic();

void asr_code_handler_app();
void app();
void _E5_89_8D_E8_BF_9B();
void _E5_8F_B3_E8_BD_AC();
void _E5_90_8E_E9_80_80();
void _E5_B7_A6_E8_BD_AC();
void _E6_91_87_E6_91_86();
void _E8_83_8C_E8_AF_B5_E6_A0_A1_E8_AE_AD();
void song();
void ASR_CODE();
void _E7_AB_8B_E6_AD_A3();
void _E8_B6_B4_E4_B8_8B();
void _E6_8F_A1_E6_89_8B();

SH1106 sh1106(128,64,2,3);

/* 电池检测功能 */
void battery_check() {
    static unsigned long last_check = 0;
    if (millis() - last_check > 60000) { // 每分钟检查一次
        battery_level--;
        if (battery_level < 20) {
            show_battery_status();
            if (battery_level < 10) {
                //{playid:10510,voice:电池电量低,请及时充电}
                play_audio(10510);
                _E8_B6_B4_E4_B8_8B(); // 进入低电量模式
            }
        }
    }
}

```

```

    }
}
last_check = millis();
}
}

/* 自动休眠功能 */
void auto_sleep() {
    if (!sleep_mode && millis() - last_activity_time > 300000) { // 5分钟无活动
        sleep_mode = true;
        //{playid:10511,voice:我要休息一会儿 }
        play_audio(10511);
        _E8_B6_B4_E4_B8_8B();
        show_emotion(2); // 显示睡眠表情
    }
}

/* 唤醒功能 */
void wake_up() {
    if (sleep_mode) {
        sleep_mode = false;
        last_activity_time = millis();
        _E7_AB_8B_E6_AD_A3();
        show_emotion(0); // 显示快乐表情
        //{playid:10512,voice:我醒啦 }
        play_audio(10512);
    }
}

/* 显示电池状态 */
void show_battery_status() {
    sh1106.clear(0);
    sh1106.set_text_color(1, 1);
    sh1106.set_text_size(1);
    sh1106.set_cursor(10, 10);
    sh1106.print("Battery: ");
    sh1106.print(battery_level);
    sh1106.print("%");

    // 绘制电池图标
    for (int i = 0; i < battery_level / 10; i++) {
        sh1106.fill_rect(10 + i * 8, 30, 6, 20, 1);
    }
    sh1106.display();
    delay(2000);
}

/* 舞蹈模式 1 */
void dance_routine1() {
    //{playid:10513,voice:开始跳舞 }

```

```

play_audio(10513);
for (int i = 0; i < 4; i++) {
    _E6_91_87_E6_91_86();
    servo_5.write(45);
    servo_1.write(135);
    delay(200);
    servo_5.write(135);
    servo_1.write(45);
    delay(200);
}
_E7_AB_8B_E6_AD_A3();
}

/* 舞蹈模式 2 */
void dance_routine2() {
    //{playid:10514,voice:再来一段舞蹈 }
    play_audio(10514);
    for (int i = 0; i < 6; i++) {
        servo_5.write(30);
        servo_1.write(150);
        servo_6.write(30);
        servo_0.write(150);
        delay(150);
        servo_5.write(150);
        servo_1.write(30);
        servo_6.write(150);
        servo_0.write(30);
        delay(150);
    }
    _E7_AB_8B_E6_AD_A3();
}

/* 锻炼模式 */
void exercise_mode() {
    //{playid:10515,voice:开始锻炼 }
    play_audio(10515);
    for (int i = 0; i < 10; i++) {
        _E5_89_8D_E8_BF_9B();
        step_count++;
    }
    for (int i = 0; i < 5; i++) {
        _E5_B7_A6_E8_BD_AC();
        _E5_8F_B3_E8_BD_AC();
    }
    show_statistics();
}

/* 跟随模式 */
void follow_mode() {
    //{playid:10516,voice:开始跟随模式 }

```

```

play_audio(10516);
unsigned long start_time = millis();
while (millis() - start_time < 30000) { // 30 秒跟随模式
    // 模拟跟随行为
    _E5_89_8D_E8_BF_9B();
    delay(1000);
    _E6_91_87_E6_91_86();
    delay(500);
}
_E7_AB_8B_E6_AD_A3();
}

/* 避障功能 */
void obstacle_avoidance() {
    //{playid:10517,voice:开始避障模式 }
    play_audio(10517);
    for (int i = 0; i < 3; i++) {
        _E5_89_8D_E8_BF_9B();
        _E5_89_8D_E8_BF_9B();
        _E5_B7_A6_E8_BD_AC();
        _E5_89_8D_E8_BF_9B();
        _E5_89_8D_E8_BF_9B();
        _E5_8F_B3_E8_BD_AC();
    }
    _E7_AB_8B_E6_AD_A3();
}

/* 显示表情 */
void show_emotion(uint8_t emotion_type) {
    switch(emotion_type) {
        case 0: // 快乐
            sh1106.show_picture(33, 0, 61, 64, happy_face);
            break;
        case 1: // 悲伤
            sh1106.show_picture(33, 0, 61, 64, sad_face);
            break;
        case 2: // 生气
            sh1106.show_picture(33, 0, 61, 64, angry_face);
            break;
        case 3: // 惊讶
            sh1106.show_picture(33, 0, 61, 64, surprised_face);
            break;
    }
    sh1106.display();
}

/* LED效果 */
void led_effect(uint8_t pattern) {
    // 模拟LED效果显示
    sh1106.clear(0);

```

```

switch(pattern) {
    case 0: // 呼吸灯效果
        for (int i = 0; i < 3; i++) {
            sh1106.fill_circle(64, 32, 20, 1);
            sh1106.display();
            delay(300);
            sh1106.fill_circle(64, 32, 20, 0);
            sh1106.display();
            delay(300);
        }
        break;
    case 1: // 跑马灯效果
        for (int x = 0; x < 128; x += 10) {
            sh1106.fill_rect(x, 0, 8, 64, 1);
            sh1106.display();
            delay(100);
            sh1106.fill_rect(x, 0, 8, 64, 0);
        }
        break;
}
}

```

```

/* 声音效果 */
void sound_effect(uint8_t type) {
    switch(type) {
        case 0:
            //{playid:10518,voice:滴滴 }
            play_audio(10518);
            break;
        case 1:
            //{playid:10519,voice:咚咚 }
            play_audio(10519);
            break;
        case 2:
            //{playid:10520,voice:哗哗 }
            play_audio(10520);
            break;
    }
}

```

```

/* 显示统计信息 */
void show_statistics() {
    sh1106.clear(0);
    sh1106.set_text_color(1, 1);
    sh1106.set_text_size(1);
    sh1106.set_cursor(5, 5);
    sh1106.print("Steps: ");
    sh1106.print(step_count);
    sh1106.set_cursor(5, 20);
    sh1106.print("Battery: ");
}

```

```

    sh1106.print(battery_level);
    sh1106.print("%");
    sh1106.set_cursor(5, 35);
    sh1106.print("Active: ");
    sh1106.print(millis() / 60000);
    sh1106.print("min");
    sh1106.display();
    delay(3000);
}

/* 安全模式 */
void security_mode() {
    //{playid:10521,voice:安全模式启动 }
    play_audio(10521);
    unsigned long start_time = millis();
    while (millis() - start_time < 60000) { // 1 分钟安全巡逻
        _E5_89_8D_E8_BF_9B();
        _E5_89_8D_E8_BF_9B();
        _E5_B7_A6_E8_BD_AC();
        sound_effect(0);
        _E5_89_8D_E8_BF_9B();
        _E5_89_8D_E8_BF_9B();
        _E5_8F_B3_E8_BD_AC();
        sound_effect(0);
    }
    _E7_AB_8B_E6_AD_A3();
}

/* 交互模式 */
void interactive_mode() {
    //{playid:10522,voice:交互模式开始 }
    play_audio(10522);
    for (int i = 0; i < 5; i++) {
        switch(i % 4) {
            case 0:
                _E6_8F_A1_E6_89_8B();
                break;
            case 1:
                _E6_91_87_E6_91_86();
                break;
            case 2:
                show_emotion(i % 4);
                break;
            case 3:
                sound_effect(i % 3);
                break;
        }
        delay(1000);
    }
    _E7_AB_8B_E6_AD_A3();
}

```

```

}

/* 学习模式 */
void learning_mode() {
    //{playid:10523,voice:学习时间到 }
    play_audio(10523);
    // 模拟学习行为序列
    uint8_t lessons[5] = {1, 2, 3, 4, 5};
    for (int i = 0; i < 5; i++) {
        switch(lessons[i]) {
            case 1:
                _E8_83_8C_E8_AF_B5_E6_A0_A1_E8_AE_AD();
                break;
            case 2:
                song();
                break;
            case 3:
                _E5_89_8D_E8_BF_9B();
                _E5_89_8D_E8_BF_9B();
                break;
            case 4:
                _E6_91_87_E6_91_86();
                _E6_91_87_E6_91_86();
                break;
            case 5:
                _E6_8F_A1_E6_89_8B();
                break;
        }
        delay(2000);
    }
    //{playid:10524,voice:学习完成 }
    play_audio(10524);
}

/* 语音反馈 */
void voice_feedback(uint16_t feedback_id) {
    switch(feedback_id) {
        case 1:
            //{playid:10525,voice:任务完成 }
            play_audio(10525);
            break;
        case 2:
            //{playid:10526,voice:继续努力 }
            play_audio(10526);
            break;
        case 3:
            //{playid:10527,voice:太棒了 }
            play_audio(10527);
            break;
        case 4:

```

```

    // {playid:10528,voice:加油 }
    play_audio(10528);
    break;
}
}

/* 系统诊断 */
void system_diagnostic() {
    sh1106.clear(0);
    sh1106.set_text_color(1, 1);
    sh1106.set_text_size(1);

    sh1106.set_cursor(5, 5);
    sh1106.print("System Check:");
    sh1106.set_cursor(5, 15);
    sh1106.print("Servo: OK");
    sh1106.set_cursor(5, 25);
    sh1106.print("Display: OK");
    sh1106.set_cursor(5, 35);
    sh1106.print("Audio: OK");
    sh1106.set_cursor(5, 45);
    sh1106.print("Battery: ");
    sh1106.print(battery_level);
    sh1106.print("%");

    sh1106.display();
    // {playid:10529,voice:系统自检完成 }
    play_audio(10529);
    delay(3000);
}

void asr_code_handler_app(){
    uint16_t asr_code_handler_snid;
    while (1) {
        if(xQueueReceive(asr_code_handler_msg,&asr_code_handler_snid,0)){
            switch (asr_code_handler_snid) {
                case 0:
                    Serial.println("start");
                    wake_up();
                    break;
                case 6:
                    while (!((snid) != 6)) {
                        _E5_89_8D_E8_BF_9B();
                        step_count++;
                    }
                    break;
                case 7:
                    while (!((snid) != 7)) {
                        _E5_90_8E_E9_80_80();
                    }
            }
        }
    }
}

```



```

        break;
case 12:
    vol_set(2);
    break;
case 8:
    while (!((snid) != 8)) {
        _E5_B7_A6_E8_BD_AC();
    }
    break;
case 9:
    while (!((snid) != 9)) {
        _E5_8F_B3_E8_BD_AC();
    }
    break;
case 10:
    while (!((snid) != 10)) {
        _E6_91_87_E6_91_86();
    }
    break;
case 11:
    _E8_83_8C_E8_AF_B5_E6_A0_A1_E8_AE_AD();
    break;
case 13:
    vol_set(4);
    break;
case 21:
    song();
    break;
case 14:
    vol_set(6);
    break;
case 20:
    while (!(((snid) == 0) || (time >= 5))) {
        flag = random(1, 8+1);
        switch (flag) {
            case 1:
                _E7_AB_8B_E6_AD_A3();
                break;
            case 2:
                _E8_B6_B4_E4_B8_8B();
                break;
            case 3:
                _E5_8F_B3_E8_BD_AC();
                _E5_8F_B3_E8_BD_AC();
                break;
            case 4:
                _E6_8F_A1_E6_89_8B();
                break;
            case 5:
                _E5_89_8D_E8_BF_9B();

```

```

        _E5_89_8D_E8_BF_9B();
        _E5_89_8D_E8_BF_9B();
        _E5_89_8D_E8_BF_9B();
        break;
    case 6:
        _E6_91_87_E6_91_86();
        _E6_91_87_E6_91_86();
        _E6_91_87_E6_91_86();
        _E6_91_87_E6_91_86();
        break;
    case 7:
        _E5_90_8E_E9_80_80();
        _E5_90_8E_E9_80_80();
        break;
    case 8:
        _E5_B7_A6_E8_BD_AC();
        _E5_B7_A6_E8_BD_AC();
        break;
    }
    delay((random(300000, 600000+1)));
    flag = 0;
    time = time + 1;
}
delay(3600000);
//{playid:10500,voice:笨笨有点困了，睡一会 }
play_audio(10500);
_E8_B6_B4_E4_B8_8B();
break;
case 5:
    while (!(snid) != 5) {
        _E6_8F_A1_E6_89_8B();
    }
    break;
// 新增命令处理
case 24: // 跳舞 1
    dance_routine1();
    break;
case 25: // 跳舞 2
    dance_routine2();
    break;
case 26: // 锻炼模式
    exercise_mode();
    break;
case 27: // 跟随模式
    follow_mode();
    break;
case 28: // 避障模式
    obstacle_avoidance();
    break;
case 29: // 安全模式

```

```

        security_mode();
        break;
    case 30: // 交互模式
        interactive_mode();
        break;
    case 31: // 学习模式
        learning_mode();
        break;
    case 32: // 系统诊断
        system_diagnostic();
        break;
    case 33: // 显示统计
        show_statistics();
        break;
    }
}

// 后台任务
battery_check();
auto_sleep();

delay(1);
}
vTaskDelete(NULL);
}

void app(){
    while (emotion == 0) {
        if (!sleep_mode) {
            // 显示默认动画表情
            const unsigned char face1[351]={/* 表情数据 1 */};
            const unsigned char face2[351]={/* 表情数据 2 */};
            const unsigned char face3[351]={/* 表情数据 3 */};

            sh1106.show_picture(14,18,100,27,face1);
            sh1106.display();
            delay(250);
            sh1106.show_picture(14,18,100,27,face2);
            sh1106.display();
            delay(250);
            sh1106.show_picture(14,18,100,27,face3);
            sh1106.display();
            delay(5000);
        } else {
            delay(1000); // 睡眠模式下减少刷新频率
        }
        delay(2);
    }
    vTaskDelete(NULL);
}

```

// 原有的运动函数保持不变

```
void _E5_89_8D_E8_BF_9B(){
```

```
    servo_5.write(30);
```

```
    servo_1.write(90);
```

```
    servo_6.write(90);
```

```
    servo_0.write(150);
```

```
    delay(100);
```

```
    servo_5.write(30);
```

```
    servo_1.write(30);
```

```
    servo_6.write(150);
```

```
    servo_0.write(150);
```

```
    delay(100);
```

```
    servo_5.write(90);
```

```
    servo_1.write(30);
```

```
    servo_6.write(150);
```

```
    servo_0.write(90);
```

```
    delay(100);
```

```
    servo_5.write(90);
```

```
    servo_1.write(90);
```

```
    servo_6.write(90);
```

```
    servo_0.write(90);
```

```
    delay(100);
```

```
    servo_5.write(90);
```

```
    servo_1.write(150);
```

```
    servo_6.write(30);
```

```
    servo_0.write(90);
```

```
    delay(100);
```

```
    servo_5.write(150);
```

```
    servo_1.write(150);
```

```
    servo_6.write(30);
```

```
    servo_0.write(30);
```

```
    delay(100);
```

```
    servo_5.write(150);
```

```
    servo_1.write(90);
```

```
    servo_6.write(90);
```

```
    servo_0.write(30);
```

```
    delay(100);
```

```
    servo_5.write(90);
```

```
    servo_1.write(90);
```

```
    servo_6.write(90);
```

```
    servo_0.write(90);
```

```
    delay(100);
```

```
    last_activity_time = millis();
```

```
}
```

```
void _E5_8F_B3_E8_BD_AC(){
```

```
    servo_5.write(90);
```

```
    servo_1.write(30);
```

```
    servo_6.write(30);
```

```
servo_0.write(90);
delay(100);
servo_5.write(150);
servo_1.write(30);
servo_6.write(30);
servo_0.write(150);
delay(100);
servo_5.write(150);
servo_1.write(90);
servo_6.write(90);
servo_0.write(150);
delay(100);
servo_5.write(90);
servo_1.write(90);
servo_6.write(90);
servo_0.write(90);
delay(100);
last_activity_time = millis();
}
```

```
void _E5_90_8E_E9_80_80(){
servo_5.write(90);
servo_1.write(90);
servo_6.write(90);
servo_0.write(90);
delay(100);
servo_5.write(150);
servo_1.write(90);
servo_6.write(90);
servo_0.write(30);
delay(100);
servo_5.write(150);
servo_1.write(150);
servo_6.write(60);
servo_0.write(60);
delay(100);
servo_5.write(90);
servo_1.write(150);
servo_6.write(30);
servo_0.write(30);
delay(100);
servo_5.write(90);
servo_1.write(90);
servo_3.write(90);
servo_0.write(90);
delay(100);
servo_5.write(90);
servo_1.write(30);
servo_6.write(150);
servo_0.write(90);
```

```
    delay(100);
    servo_5.write(30);
    servo_1.write(30);
    servo_6.write(150);
    servo_0.write(150);
    delay(100);
    servo_5.write(30);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(150);
    delay(100);
    last_activity_time = millis();
}

void _E5_B7_A6_E8_BD_AC(){
    servo_5.write(90);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(90);
    delay(100);
    servo_5.write(150);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(150);
    delay(100);
    servo_5.write(150);
    servo_1.write(30);
    servo_6.write(30);
    servo_0.write(150);
    delay(100);
    servo_5.write(90);
    servo_1.write(30);
    servo_6.write(30);
    servo_0.write(90);
    delay(100);
    last_activity_time = millis();
}

void _E6_91_87_E6_91_86(){
    servo_5.write(60);
    servo_1.write(120);
    servo_6.write(60);
    servo_0.write(120);
    delay(100);
    servo_5.write(120);
    servo_1.write(60);
    servo_6.write(120);
    servo_0.write(60);
    delay(100);
    last_activity_time = millis();
}
```

```

}

void _E8_83_8C_E8_AF_B5_E6_A0_A1_E8_AE_AD(){
    servo_5.write(0);
    servo_1.write(90);
    servo_6.write(90);
    servo_0.write(90);
    delay(1000);
    servo_5.write(90);
    servo_1.write(180);
    servo_6.write(90);
    servo_0.write(90);
    //{playid:10501,voice:上理同学大家好 }
    play_audio(10501);
    last_activity_time = millis();
}

void song(){
    servo_5.write(180);
    servo_1.write(0);
    servo_6.write(180);
    servo_0.write(0);
    //{playid:10502,voice:举头望明月 }
    play_audio(10502);
    delay(1000);
    servo_5.write(0);
    servo_1.write(180);
    servo_6.write(90);
    servo_0.write(90);
    //{playid:10503,voice:低头思故乡 }
    play_audio(10503);
    last_activity_time = millis();
}

void ASR_CODE(){
    switch (snid) {
        case 1:
            delay(100);
            servo_5.write(90);
            servo_1.write(90);
            servo_6.write(90);
            servo_0.write(90);
            _E8_BF_90_E5_8A_A8 = 0;
            time = 0;
            break;
        case 2:
            delay(100);
            servo_5.write(0);
            servo_1.write(180);
            servo_6.write(0);
    }
}

```

```
servo_0.write(180);
_E8_BF_90_E5_8A_A8 = 0;
break;
case 3:
delay(100);
servo_5.write(90);
servo_1.write(90);
servo_6.write(0);
servo_0.write(180);
_E8_BF_90_E5_8A_A8 = 0;
break;
case 4:
delay(100);
servo_5.write(0);
servo_1.write(180);
servo_6.write(90);
servo_0.write(90);
_E8_BF_90_E5_8A_A8 = 0;
break;
case 5:
_E8_BF_90_E5_8A_A8 = 0;
break;
case 6:
_E8_BF_90_E5_8A_A8 = 6;
break;
case 7:
_E8_BF_90_E5_8A_A8 = 7;
break;
case 8:
_E8_BF_90_E5_8A_A8 = 8;
break;
case 9:
_E8_BF_90_E5_8A_A8 = 9;
break;
case 10:
_E8_BF_90_E5_8A_A8 = 10;
break;
// 新增命令
case 24:
case 25:
case 26:
case 27:
case 28:
case 29:
case 30:
case 31:
case 32:
case 33:
xQueueSend(asr_code_handler_msg,&snid,0);
break;
```



```

}

// 原有的队列发送逻辑
if(snid == 0 || snid == 6 || snid == 7 || snid == 12 || snid == 8 ||
   snid == 9 || snid == 10 || snid == 11 || snid == 13 || snid == 21 ||
   snid == 14 || snid == 20 || snid == 5 || snid == 22){
  xQueueSend(asr_code_handler_msg,&snid,0);
}

// 功能
if((snid) == 22){
  // 相关代码...
  emotion = 1;
  // 显示表情序列...
  emotion = 0;
  delay(500);
  _E5_89_8D_E8_BF_9B();
  _E5_89_8D_E8_BF_9B();
  _E5_89_8D_E8_BF_9B();
  _E5_89_8D_E8_BF_9B();
  delay(1000);
}

if((snid) == 15){
  servo_5.write(180);
  servo_1.write(0);
  servo_6.write(180);
  servo_0.write(0);
}
}

void _E7_AB_8B_E6_AD_A3(){
  servo_5.write(90);
  servo_1.write(90);
  servo_6.write(90);
  servo_0.write(90);
  last_activity_time = millis();
}

void _E8_B6_B4_E4_B8_8B(){
  servo_5.write(0);
  servo_1.write(180);
  servo_6.write(0);
  servo_0.write(180);
  last_activity_time = millis();
}

void _E6_8F_A1_E6_89_8B(){
  delay(100);
  servo_5.write(0);

```

```
servo_1.write(90);  
servo_6.write(90);  
servo_0.write(90);  
delay(100);  
servo_5.write(15);  
last_activity_time = millis();  
}  
  
void hardware_init(){  
    asr_code_handler_msg=xQueueCreate(10,4); // 增加队列大小  
    vol_set(1);  
    xTaskCreate(app,"app",256,NULL,4,NULL); // 增加堆栈大小  
    vTaskDelete(NULL);  
}
```