环境：

SDK：hclinux-2023.07.y （rtos跟linux都支持）

本次举例是基于公板的 hcprojectorapp 应用去使用的，用户先仿照下面的具体使用步骤去一步一步操作，接收验证黑场检测功能。接收后再按用户的具体需求自行去修改使用。

本次举例的具体使用步骤：

第一步：将black_field_detection.c文件复制粘贴到SOURCE\applications\hcprojectorapp\hcprojector_app\目录下：

SOURCE\applications\hcprojectorapp\hcprojector_app\black_field_detection.c

第二步：修改SOURCE\applications\hcprojectorapp\hcprojector_app\app_config.h 文件（文件内容可以看附件里的app_config.h）：

SOURCE > applications > hcprojectorapp > hcprojector_app > C app_config.h

```
151
152   #ifdef CONFIG_APPS_PROJETOR_CHUANGWEI_BT
153   #define CHUANGWEI_BT
154   #endif
155
156   #define BLACK_FIELD_DETECTION_SUPPORT
157   #endif //end of __HCDEMO_CONFIG_H__
158
159
160
```

定义一个宏

第三步：修改SOURCE\applications\hcprojectorapp\hcprojector_app\projector.c文件（文件内容可以看附件里的projector.c）：

SOURCE > applications > hcprojectorapp > hcprojector_app > C projector.c > ...

```
34   #include <nccast/nccast_com.h>
35   #endif
36
37   #ifdef BLACK_FIELD_DETECTION_SUPPORT
38   extern int initialize_blackout_detection(int argc, char *argv[]);
39   #endif
40
```

函数声明

SOURCE > applications > hcprojectorapp > hcprojector_app > C projector.c > main(int, char * [])

```
826
827     change_screen(projector_get_some_sys_param(P_CUR_CHANNEL));
828     api_dis_show_onoff(0);
829      /*Handle LitlevGL tasks (tickless mode)*/
830
831   #ifdef BLACK_FIELD_DETECTION_SUPPORT
832       initialize_blackout_detection(0,NULL);
833   #endif
834
835       #ifdef USB_AUTO_UPGRADE
836           sys_upg_usb_check_init();
```

黑场检测初始化

第四步：修改SOURCE\applications\hcprojectorapp\hcprojector_app\channel\cvbs_in\cvbs_rx.c（文件内容可以看附件里的cvbs_rx.c）：

SOURCE > applications > hcprojectorapp > hcprojector_app > channel > cvbs_in > C cvbs_rx.c > ...

```
56  static enum TVTYPE tv_sys = TV_NTSC;
57  static bool tv_dec_started = false;
58
59  #ifdef BLACK_FIELD_DETECTION_SUPPORT
60      int blackout_check_start(int argc, char *argv[]);
61      int blackout_check_stop(int argc, char *argv[]);
62  #endif
63
64  int cvbs_rx_start(void);
```

函数声明

SOURCE > applications > hcprojectorapp > hcprojector_app > channel > cvbs_in > C cvbs_rx.c > cvbs_rx_start(void)

```
438
439 int cvbs_rx_start(void)
440 {
441 #ifdef BLACK_FIELD_DETECTION_SUPPORT
442     blackout_check_start(0, NULL);
443 #endif
```

黑场检测开始

SOURCE > applications > hcprojectorapp > hcprojector_app > channel > cvbs_in > C cvbs_rx.c > cvbs_rx_stop(void)

```
504
505 int cvbs_rx_stop(void)
506 {
507 #ifdef BLACK_FIELD_DETECTION_SUPPORT
508     blackout_check_stop(0,NULL);
509 #endif
510     tv_dec_started = false;
511     if(tv_dec_fd > 0)
512     {
```

黑场检测停止

第五步：修改SOURCE\applications\hcprojectorapp\hcprojector_app\channel\local_mp\media_player.c（文件内容可以看附件里的media_player.c）：

SOURCE > applications > hcprojectorapp > hcprojector_app > channel > local_mp > C media_player.c > ...

```
39  #include "mp_playlist.h"
40  #include "ffplayer_manager.h"
41
42  #ifdef BLACK_FIELD_DETECTION_SUPPORT
43      int blackout_check_start(int argc, char *argv[]);
44      int blackout_check_stop(int argc, char *argv[]);
45  #endif
46
```

函数声明

SOURCE > applications > hcprojectorapp > hcprojector_app > channel > local_mp > C media_player.c > media_play(media_handle_t *, cons

```
654         printf("hcplayer_create() fail!\n");
655         pthread_mutex_unlock(&media_hld->api_lock);
656         return API_FAILURE;
657     }
658     hcplayer_play(media_hld->player);
659 #ifdef BLACK_FIELD_DETECTION_SUPPORT
660     blackout_check_start(0, NULL);
661 #endif
662     media_hld->state = MEDIA_PLAY;
```

黑场检测开始

SOURCE > applications > hcprojectorapp > hcprojector_app > channel > local_mp > C media_player.c > media_stop(me

```
733  int media_stop(media_handle_t *media_hld)
734  {
735      ASSERT_API(media_hld);
736      pthread_mutex_lock(&media_hld->api_lock);
737
738      if (!media_hld->player || media_hld->state == MEDIA_STOP){
739          pthread_mutex_unlock(&media_hld->api_lock);
740          return API_FAILURE;
741      }
742      hcplayer_stop2(media_hld->player, m_closevp, m_fillblack);
743  #ifdef BLACK_FIELD_DETECTION_SUPPORT
744      blackout_check_stop(0,NULL);
745  #endif
746      media_hld->player = NULL;
```

黑场检测停止

第六步：修改

SOURCE\applications\hcprojectorapp\hcprojector_app\channel\hdmi_in\hdmi_rx.c（文件内容可以看附件里的hdmi_rx.c）：

SOURCE > applications > hcprojectorapp > hcprojector_app > channel > hdmi_in > C hdmi_rx.c > ...

```
74   #endif
75
76   #ifdef BLACK_FIELD_DETECTION_SUPPORT
77       int blackout_check_start(int argc, char *argv[]);
78       int blackout_check_stop(int argc, char *argv[]);
79   #endif
80
}
static int hdmirx_start(void)
{
#ifdef BLACK_FIELD_DETECTION_SUPPORT
    blackout_check_start(0, NULL);
#endif
    int ret = 0;

476  int hdmirx_pause(void)
477  {
478  #ifdef BLACK_FIELD_DETECTION_SUPPORT
479      blackout_check_stop(0,NULL);
480  #endif
481      printf("%s:%d: \n"     func       LINE   );

492  }
493  int hdmirx_resume(void)
494  {
495  #ifdef BLACK_FIELD_DETECTION_SUPPORT
496      blackout_check_start(0, NULL);
497  #endif
```

函数声明

```
529  int hdmi_rx_leave(void)
530  {
531  #ifdef BLACK_FIELD_DETECTION_SUPPORT
532      blackout_check_stop(0,NULL);
533  #endif
```

备注：

黑场检测的原理就是从DE获取一帧的数据，判断它是不是黑色。上面的具体使用步骤只是为了告诉用户怎么去使用black_field_detection.c里面的代码。