多媒体之人脸识别应用

何畔龙

ByteDance字节跳动

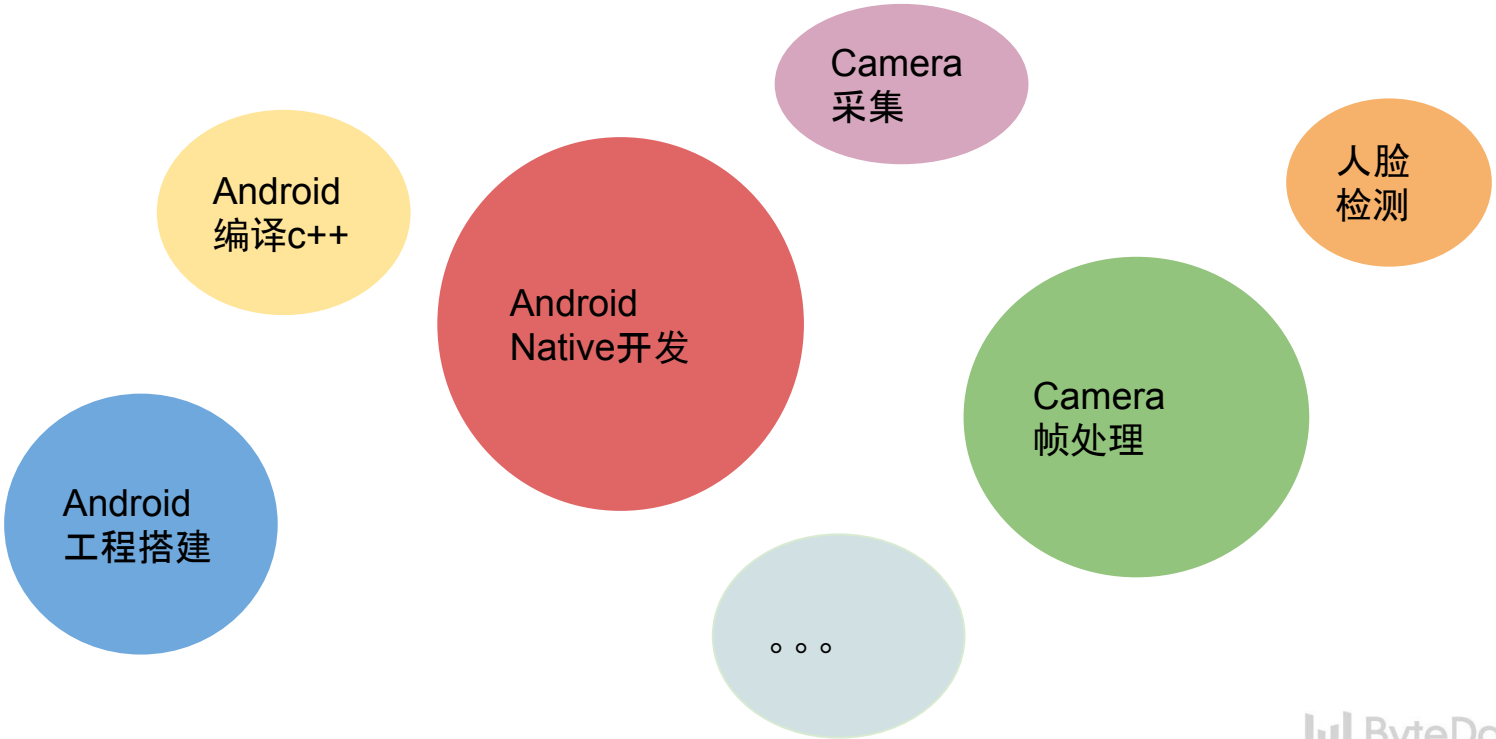
课程内容

- 安装体验demo
- 知识点梳理
- Camera采集流程
- 认识Camera数据
- 认识Android的Native编程
- Android的Native开发工程搭建
- 功能实现

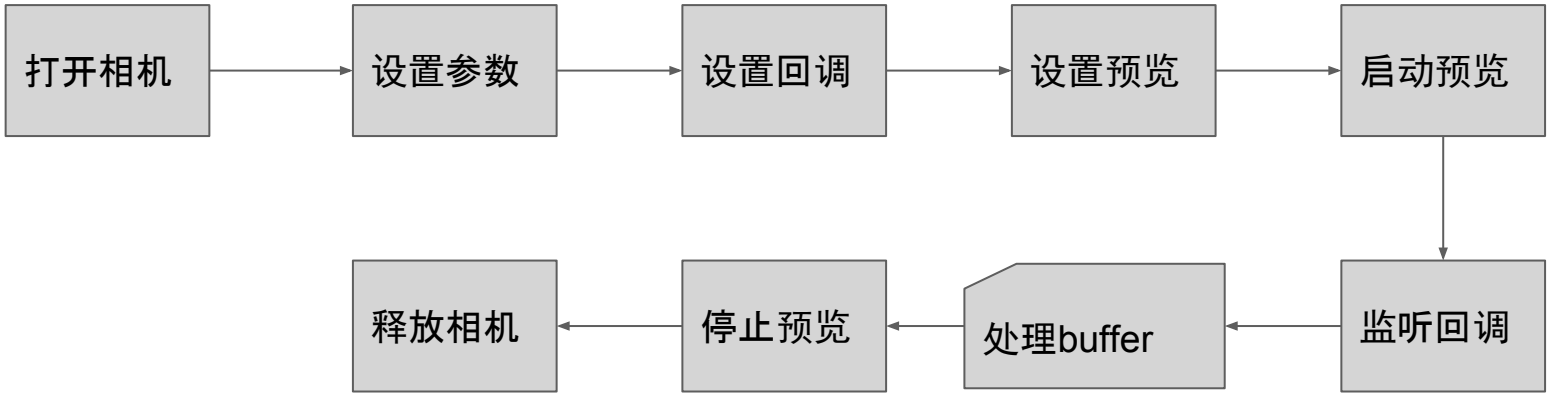
安装体验Demo

下载apk

知识点梳理

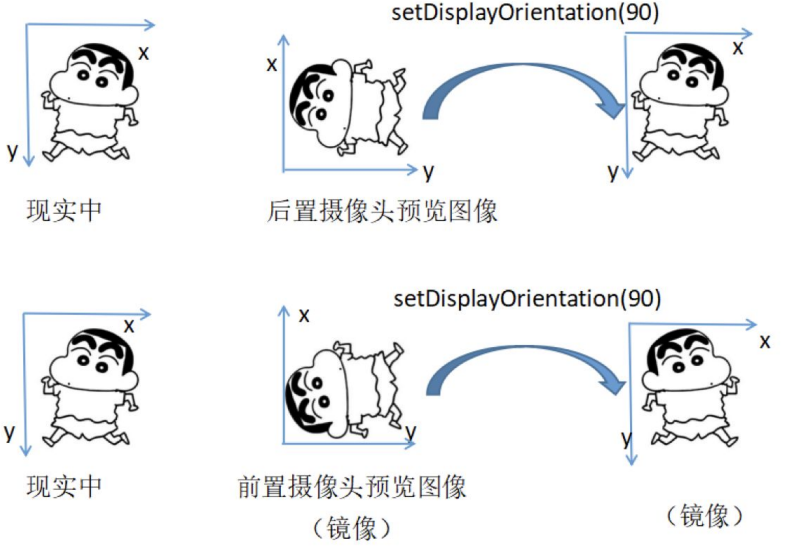


Camera采集流程

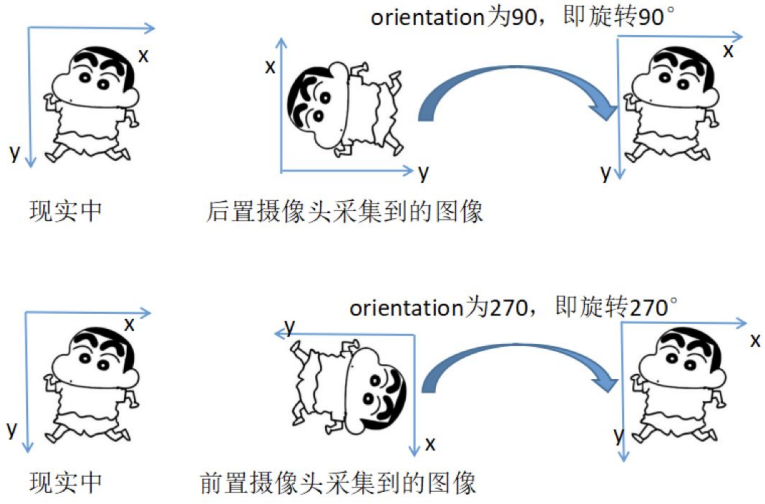


针对buffer采集

Camera采集流程

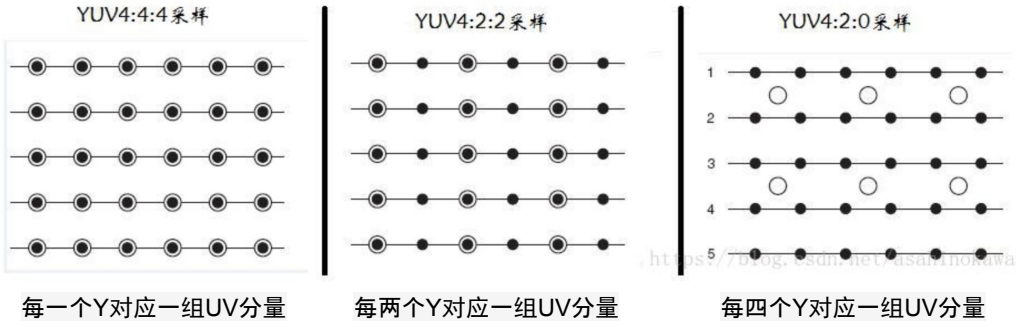


预览



采集

Camera采集流程



YUV Formats分成两个格式:

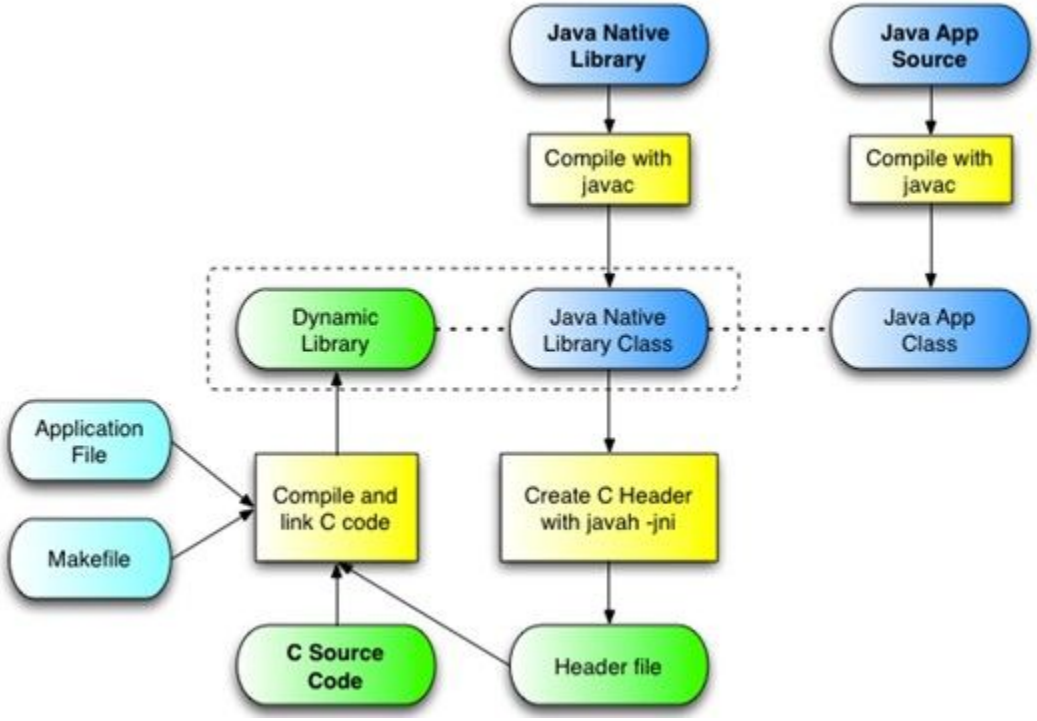
紧缩格式(packed formats):将Y、U、V值储存成Macro Pixels阵列, 和RGB的存放方式类似。

平面格式(planar formats):将Y、U、V的三个分量分别存放在不同的矩阵中。

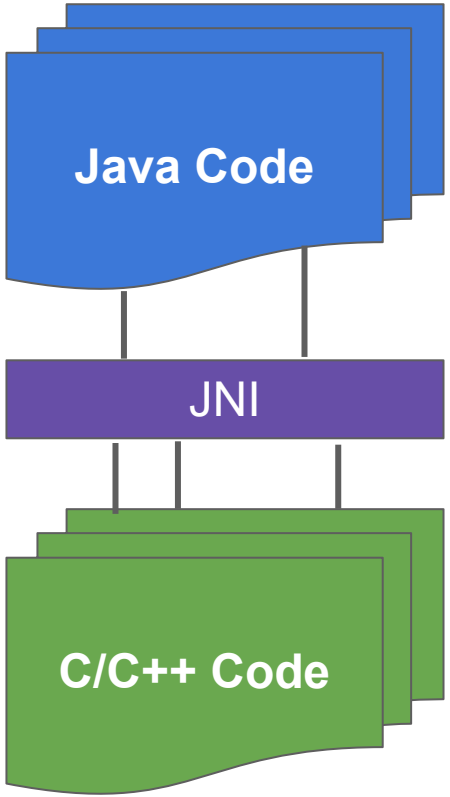
Packed Formats:YUV422(YUVY/UYVY)

Planar Formats:YUV422(YUV422P)、 YUV420(YV12/YU12/NV12/NV21)

Android Native编程 - 整体架构



Android Native编程 - JNI



Android Native编程 - CMake

```
#添加一个外部动态库
add_library( libeffect
        SHARED
        IMPORTED )
set_target_properties( # Specifies the target library.
        libeffect
        # Specifies the parameter you want to define.
        PROPERTIES IMPORTED_LOCATION
        # Provides the path to the library you want to import.

"${CMAKE_SOURCE_DIR}/libs/armeabi-v7a/libeffect.so")
```

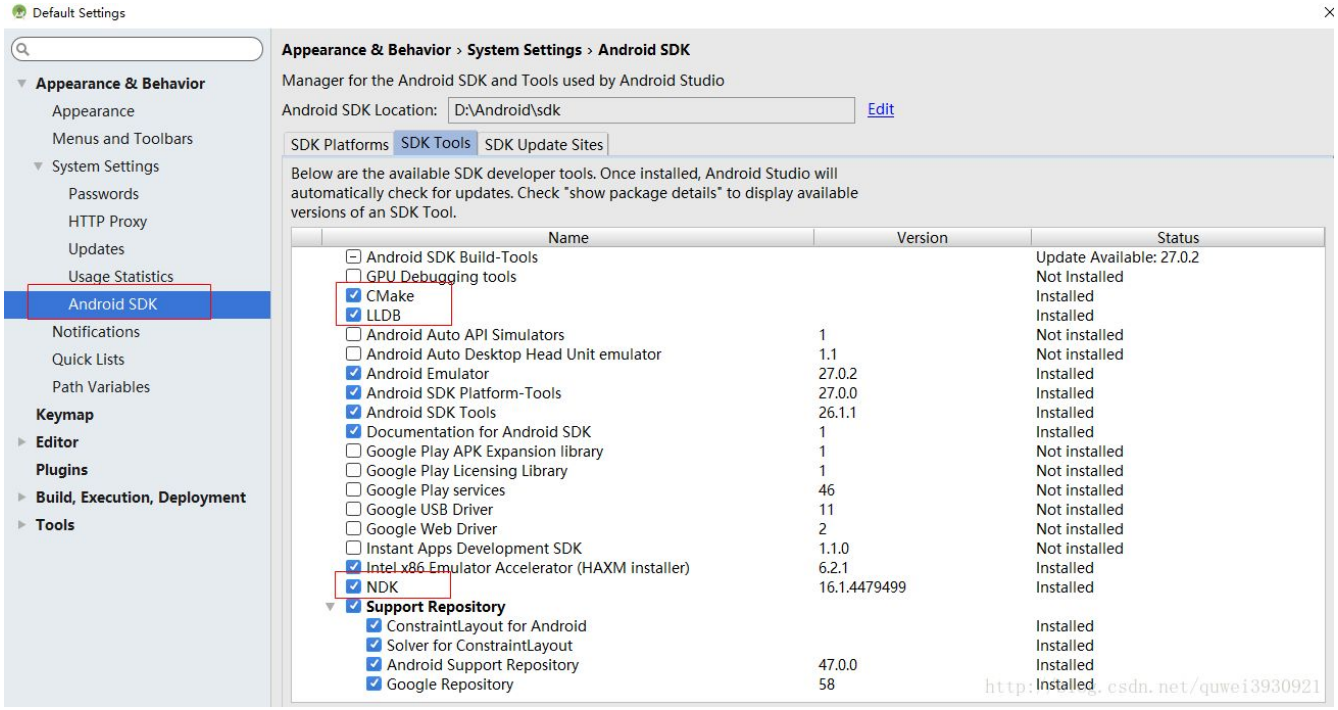
```
#添加一个外部动态库
add_library( libyuv
        STATIC
        IMPORTED )
set_target_properties( # Specifies the target library.
        libyuv
        # Specifies the parameter you want to define.
        PROPERTIES IMPORTED_LOCATION
        # Provides the path to the library you want to import.
        "${CMAKE_SOURCE_DIR}/libs/armeabi-v7a/libyuv.a")
```

```
#添加一个内部动态库
add_library( # Sets the name of the library.
        native-lib
        # Sets the library as a shared library.
        SHARED
        # Provides a relative path to your source file(s).
        src/main/cpp/native-lib.cpp
        src/main/cpp/TEUtils.cpp
        src/main/cpp/facedetect/FaceDetectHelper.cpp)
```

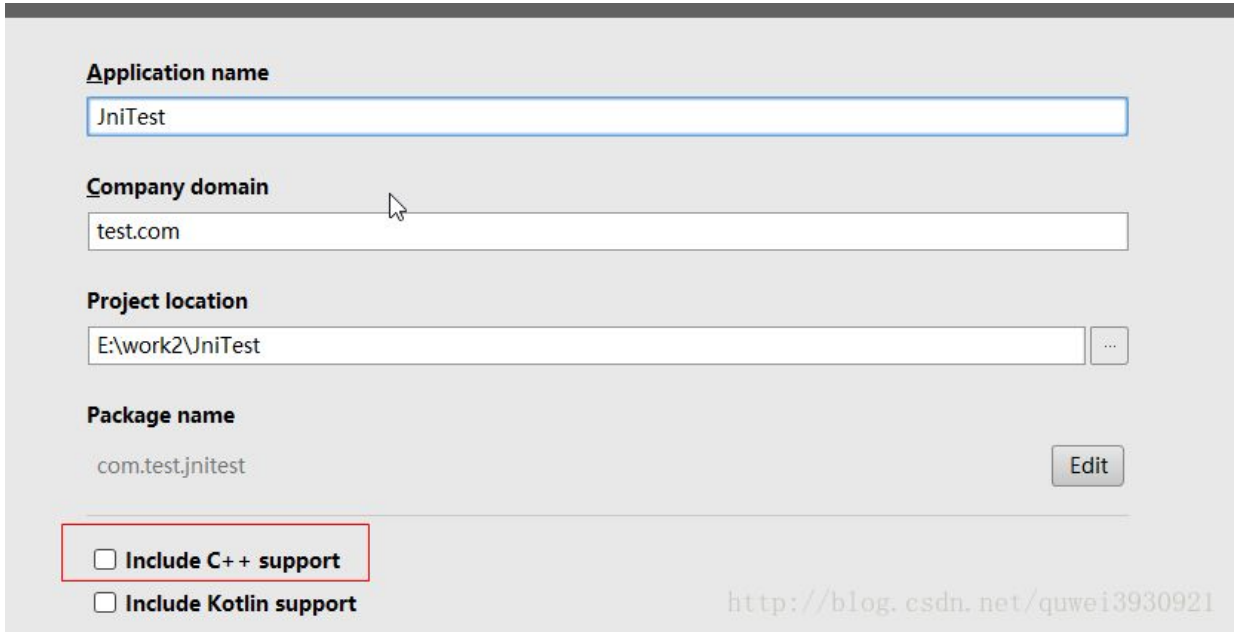
```
#头文件
include_directories(
        ${CMAKE_SOURCE_DIR}/src/main/cpp/include

${CMAKE_SOURCE_DIR}/src/main/cpp/include/libyuv
${CMAKE_SOURCE_DIR}/src/main/cpp/facedetect
)
```

```
#连接到自己要生成的动态库
target_link_libraries( # Specifies the target library.
        native-lib
        # Links the target library to the log library
        # included in the NDK.
        libyuv libeffect ${log-lib})
```

Android Native编程 - 工程搭建



Android Native编程 - 工程搭建

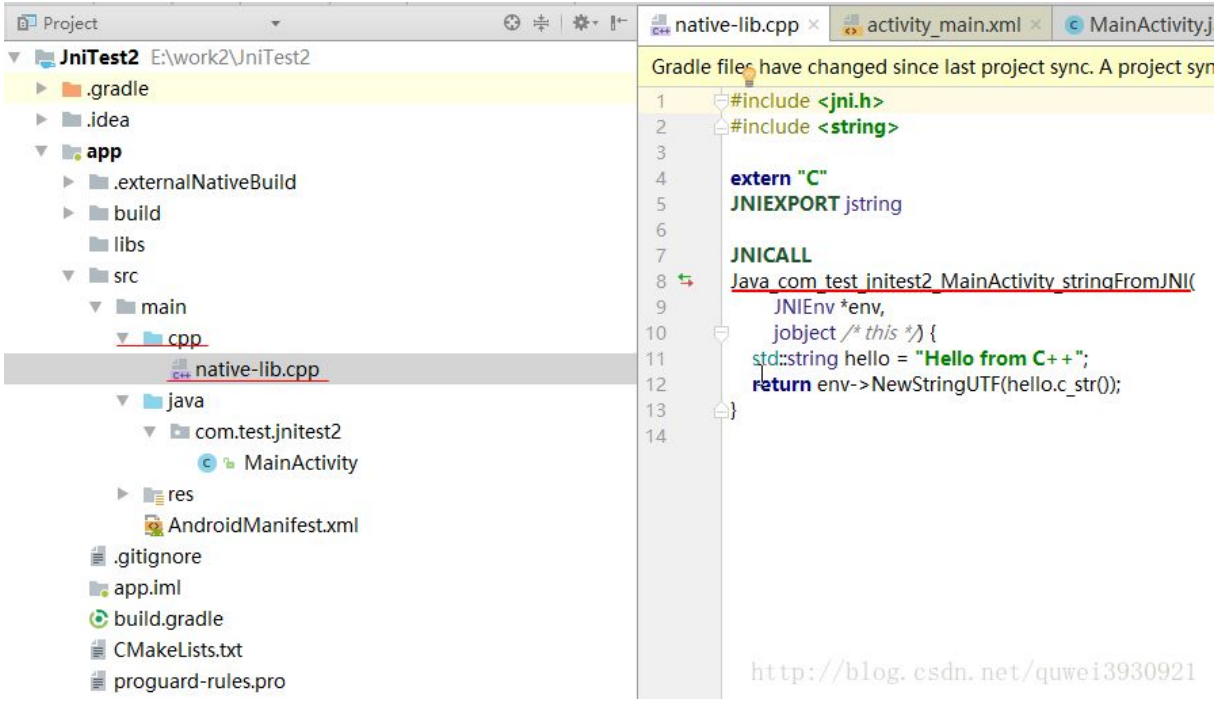


注意观察：
1、CMakelist.txt
2、build.gradle

Android Native编程 - 工程搭建

```
android {
    compileSdkVersion 28
    defaultConfig {
        applicationId "com.bytedance.ies.camerarecorddemoapp"
        minSdkVersion 18
        targetSdkVersion 28
        versionCode 1
        versionName "1.0"
        testInstrumentationRunner "android.support.test.runner.AndroidJUnitRunner"

        sourceSets {
            main {
                jniLibs.srcDirs = ['libs']
            }
        }

        externalNativeBuild {
            cmake {
                cppFlags ""
            }
        }
        ndk {
            abiFilters 'armeabi-v7a'
        }
    }
    buildTypes {
        release {
            minifyEnabled false
            proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-rules.pro'
        }
    }
    externalNativeBuild {
        cmake {
            path "CMakeLists.txt"
        }
    }
}
```

Android Native编程 - 工程搭建



自己新建一个工程运行起来

作业

1、将人脸数据返回值增加人脸位置数据
2、根据返回的人脸位置数据在预览的时候加上方框
3、根据返回的人脸表情、动作数据在预览的时候用图片替代数字展示

THANKS