HZLBlueTooth_V1.0 SDK for iOS

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SDK Version: 1.0

MCU: 2.3

目录

HZLBlueTooth 开发指南

介绍

本指南将教你如何使用 HZLBlueTooth SDK 从宏智力公司的硬件中获取脑电波数据。这将使您的 iOS 应用程序能够接收和使用脑波数据，如 BLEMIND 和 BLEGRAVITY，你可以通过蓝牙，宏智力公司的硬件，和文件资源 HZLBlueTooth 来获取他们。

功能:
接收脑波数据。同一时刻只可以连接一个蓝牙设备。

文件包含：

- API 参考(此文档)
- SDK 静态库和头文件
- libHzlBlueTooth_V1.0.a
- HZLBlueData.h
- Blue3OrBlue4Manager.h
- IOS_Blue3OrBlue4Demo 例子(iOS)

支持的硬件设备：

- 蓝牙 4.0 BLE
  - BrainLink_Pro
  - Jii
- 蓝牙 3.0
  - BrainLink_Lite
  - Mind Link

支持的 iOS 版本：

- iOS 9.0 +

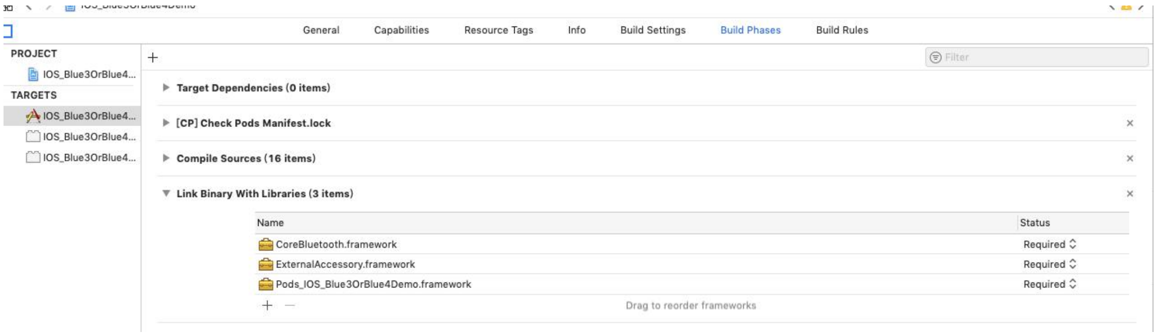
你的第一个项目: IOS_Blue3OrBlue4Demo

第一步:

1.1 在 Xcode 项目里 TARGETS - Build Phases 导入 IOS 系统框架库如下

- CoreBluetooth.framework
- ExternalAccessory.framework

如图：



▶ Target Dependencies (0 items)

▶ [CP] Check Pods Manifest.lock

▶ Compile Sources (16 items)

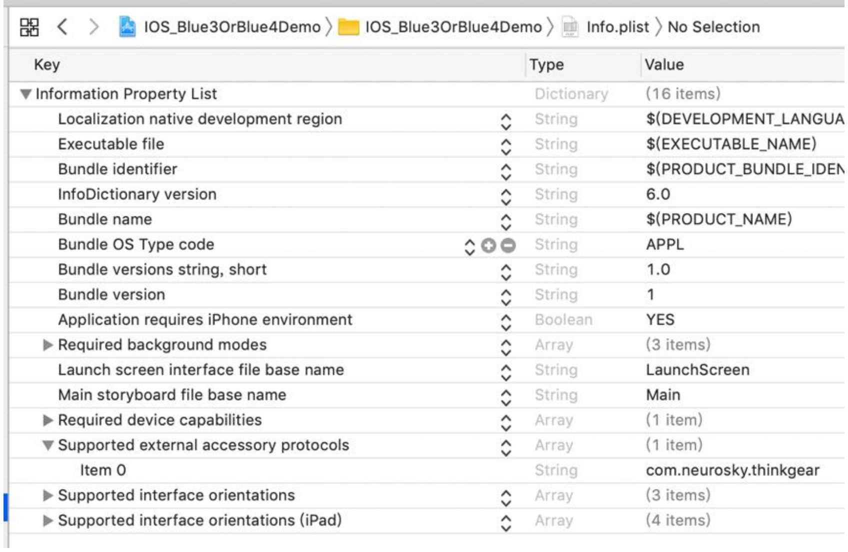
▼ Link Binary With Libraries (3 items)

Name	Status
CoreBluetooth.framework	Required
ExternalAccessory.framework	Required
Pods_IOS_Blue3OrBlue4Demo.framework	Required

Drag to reorder frameworks

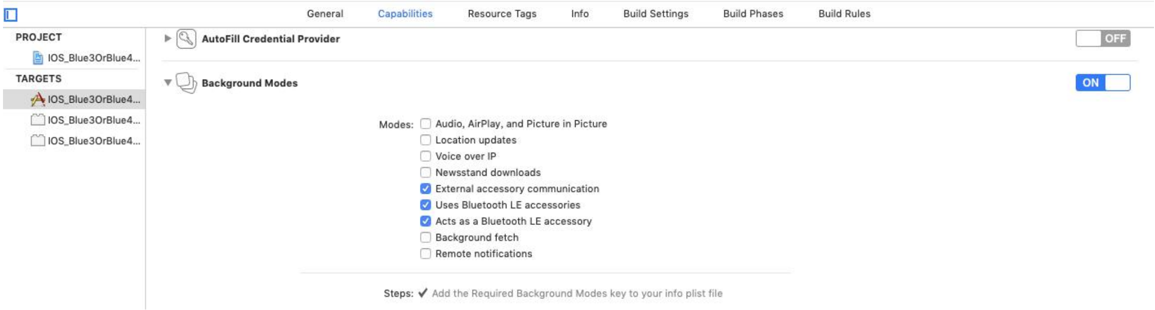
在 Info.plist 里添加 com.neurosky.thinkgear （IOS13 需要添加蓝牙权限 Privacy - Bluetooth Always Usage Description，Privacy - Bluetooth Peripheral Usage Descriptio）

如图：


IOS_Blue3OrBlue4Demo 〉 IOS_Blue3OrBlue4Demo 〉 Info.plist 〉 No Selection

Key	Type	Value
▼ Information Property List	Dictionary	(16 items)
Localization native development region	String	$(DEVELOPMENT_LANGUA
Executable file	String	$(EXECUTABLE_NAME)
Bundle identifier	String	$(PRODUCT_BUNDLE_IDEN
InfoDictionary version	String	6.0
Bundle name	String	$(PRODUCT_NAME)
Bundle OS Type code	String	APPL
Bundle versions string, short	String	1.0
Bundle version	String	1
Application requires iPhone environment	Boolean	YES
▶ Required background modes	Array	(3 items)
Launch screen interface file base name	String	LaunchScreen
Main storyboard file base name	String	Main
▶ Required device capabilities	Array	(1 item)
▼ Supported external accessory protocols	Array	(1 item)
Item 0	String	com.neurosky.thinkgear
▶ Supported interface orientations	Array	(3 items)
▶ Supported interface orientations (iPad)	Array	(4 items)

1.2 如果你想让蓝牙可以在后台运行，请如下设置，不需要则不必设置
如图：



AutoFill Credential Provider OFF

Background Modes ON

Modes:
- □ Audio, AirPlay, and Picture in Picture
- □ Location updates
- □ Voice over IP
- □ Newsstand downloads
- ☑ External accessory communication
- ☑ Uses Bluetooth LE accessories
- ☑ Acts as a Bluetooth LE accessory
- □ Background fetch
- □ Remote notifications

Steps: ✓ Add the Required Background Modes key to your info plist file

第二步：

导入头文件

```
#import "HZLBlueData.h"
#import "Blue3OrBlue4Manager.h"
```

功能：接收数据

```
    //蓝牙连接
    NSArray *blue3Name = @[@"BrainLink",@"BrainLink_Pro",@"BrainLink_Lite"];
    [Blue3OrBlue4Manager logEnable:YES];
    [[Blue3OrBlue4Manager shareInstance] configureBlue3MFiOrBlue4Names:blue3Name];

    //连接蓝牙成功回调
      __weak FactoryViewController *weakSelf = self;
    [Blue3OrBlue4Manager shareInstance].blueConBlock =    ^(BlueType conBT){
        //判断连接的设备
        if (conBT == BlueType_3) {
            NSLog(@"蓝牙 3.0 连接");
        }
        else if(conBT == BlueType_4Pro)
        {
            NSLog(@"蓝牙 4.0 Pro 连接");
        }
        else if (conBT == BlueType_4Jii){
            NSLog(@"蓝牙 4.0 Jii 连接");
        }
    };


    //蓝牙断开回调
    [Blue3OrBlue4Manager shareInstance].blueDisBlock =    ^(BlueType disBT){
        if (disBT == BlueType_3) {
            NSLog(@"蓝牙 3.0 断开");
        }
        else if(disBT == BlueType_4Pro)
        {
            NSLog(@"蓝牙 4.0 Pro 断开");
        }
        else if(disBT == BlueType_4Jii)
        {
            NSLog(@"蓝牙 4.0 Jii 断开");
        }

        weakSelf.signalIv.image = [UIImage imageNamed:@"noSignal"];

        weakSelf.attentionlabel.text = @"";
        weakSelf.medlabel.text = @"";
        weakSelf.electricityLabel.text = @"";
        weakSelf.favrouteRateLabel.text = @"";
        weakSelf.otherLabel.text = @"";

        weakSelf.circleRateLabel.text = @"";

        weakSelf.rawLabel.text = @"";
        weakSelf.pDataLabbel.text= @"";
    };


    [Blue3OrBlue4Manager shareInstance].hzlblueDataBlock = ^(HZLBlueData *blueData, BlueType
conBT){

        if (conBT == BlueType_4Pro) {
            NSString *peripID = [blueData.identifier
substringWithRange:NSMakeRange(blueData.identifier.length - 5, 4)];
            if (blueData.bleDataType == BLEMIND) {

                weakSelf.attentionlabel.text = [NSString
stringWithFormat:@"%@=%d",peripID,blueData.attention];
                weakSelf.medlabel.text = [NSString
stringWithFormat:@"%@=%d",peripID,blueData.meditation];
                weakSelf.electricityLabel.text = [NSString
stringWithFormat:@"%@=%d",peripID, blueData.batteryCapacity];
                weakSelf.favrouteRateLabel.text = [NSString stringWithFormat:@"%@=%d
",peripID,blueData.ap];

                weakSelf.otherLabel.text = [NSString stringWithFormat: @"%@=Delta:%d Theta:%d
LowAlpha:%d HighAlpha:%d LowBeta:%d HighBeta:%d LowGamma:%d HighGamma:%d
Hardwareversion:%d
grid=%d",peripID,blueData.delta,blueData.theta,blueData.lowAlpha,blueData.highAlpha,blueData.low
Beta,blueData.highBeta,blueData.lowGamma,blueData.highGamma,blueData.hardwareVersion,blueD
ata.grind];
```

```
                //信号值为0 即佩戴了蓝牙设备
                //注：如果连接了蓝牙设备而未佩戴，信号值为大于0且小于或等于200
                if(blueData.signal == 0){
                    weakSelf.signalIv.image = [UIImage imageNamed:@"signal_zhengChang"];
                }else{
                     weakSelf.signalIv.image = [UIImage imageNamed:@"signal3"];
                }
            }
            if (blueData.bleDataType == BLEGRAVITY) {
                weakSelf.circleRateLabel.text = [NSString stringWithFormat:@"%@=x:%d y:%d z:%d
",peripID,blueData.xvlaue,blueData.yvlaue,blueData.zvlaue];
            }
            if(blueData.bleDataType == BLERaw)
            {
                 weakSelf.rawLabel.text = [NSString stringWithFormat:@"Blue3=Raw:%d
Blinkeye:%d",blueData.raw,blueData.blinkeye];
            }


        }
        else if (conBT == BlueType_4Jii){
            NSString *peripID = [blueData.identifier
substringWithRange:NSMakeRange(blueData.identifier.length - 5, 4)];
            if (blueData.bleDataType == BLEMIND){

                weakSelf.attentionlabel.text = [NSString
stringWithFormat:@"%@=%d",peripID,blueData.attention];
                weakSelf.medlabel.text = [NSString
stringWithFormat:@"%@=%d",peripID,blueData.meditation];
                weakSelf.electricityLabel.text = [NSString
stringWithFormat:@"%@=%d",peripID, blueData.batteryCapacity];
                weakSelf.favrouteRateLabel.text = [NSString stringWithFormat:@"%@=%d
",peripID,blueData.ap];

                if(blueData.signal == 0){
                    weakSelf.signalIv.image = [UIImage imageNamed:@"signal_zhengChang"];
                }else{
                     weakSelf.signalIv.image = [UIImage imageNamed:@"signal3"];
                }

            }


        }
        else if (conBT == BlueType_3){
            if (blueData.bleDataType == BLEMIND){
                weakSelf.attentionlabel.text = [NSString
stringWithFormat:@"Blue3=%d",blueData.attention];
                weakSelf.medlabel.text = [NSString
stringWithFormat:@"Blue3=%d",blueData.meditation];

                weakSelf.otherLabel.text = [NSString stringWithFormat: @"Blue3=Delta:%d
Theta:%d LowAlpha:%d HighAlpha:%d LowBeta:%d HighBeta:%d LowGamma:%d HighGamma:%d
",blueData.delta,blueData.theta,blueData.lowAlpha,blueData.highAlpha,blueData.lowBeta,blueData.hi
ghBeta,blueData.lowGamma,blueData.highGamma];

                if(blueData.signal == 0){
                    weakSelf.signalIv.image = [UIImage imageNamed:@"signal_zhengChang"];
                }else{
                     weakSelf.signalIv.image = [UIImage imageNamed:@"signal3"];
                }

            }

            if(blueData.bleDataType == BLERaw){
                weakSelf.rawLabel.text = [NSString stringWithFormat:@"Blue3=Raw:%d
Blinkeye:%d",blueData.raw,blueData.blinkeye];            }

        }
    };


  [[Blue3OrBlue4Manager shareInstance] connectBlue3OrBlue4];

     // 主动断开蓝牙
  [[Blue3OrBlue4Manager shareInstance]disConnectBlue3OrBlue4];
```

HZLBlueData 参考

Overview
该类是数据模型

Enum

```
typedef enum : NSUInteger {
    BlueType_NO = 0,
BlueType_3,
/*连接的是BrainLink_Lite等(蓝牙3.0设备),有BLEMIND、BLEGRAVITY、BLERaw类型数据 */
BlueType_4Pro,
/*连接的是BrainLink_Pro(蓝牙4.0设备)，有BLEMIND、BLEGRAVITY、BLERaw类型数据 */
    BlueType_4Jii,
/*连接的是Jii(蓝牙4.0设备) */
}BlueType;
        typedef NS_ENUM(NSUInteger,BLEDATATAYPE){
        BLEMIND    =    0,              //脑波数据
        BLEGRAVITY,                    //重力数据
        BLERaw,                         //Raw眨眼数据
};
```

脑波数据：

- signal，设备佩戴质量
- attention，专注度
- meditation，放松度
- delta,
- theta,
- lowAlpha,
- highAlpha,
- lowBeta,
- highBeta,
- lowGamma,
- highGamma,
- ap，喜好度
- batteryCapacity，电池电量百分比
- hardwareVersion，设备固件版本
- grind

重力数据:

- xvlaue,
- yvlaue,
- zvlaue

Raw 眨眼数据:

- raw,
- blinkeye

注释：

连接 Jii，只有 signal，attention，meditation，batteryCapacity，ap

连接 BrainLink_Lite，只有 signal，attention，meditation，delta，theta，lowAlpha，highAlpha，lowBeta，highBeta， lowGamma， highGamma，raw，blinkeye

Instructions of some Instance Property

- signal:信号值。当信号为 0，表示已经戴好，当信号值为 200 表示硬件和手机通过蓝牙已经连接
- batteryCapacity: 电池容量百分比
- ap: 喜好度
- hardwareVersion: 硬件版本。第一个版本值为 255,当你更新硬件成功后, 硬件的版本值将会变小
- xvlaue： 重力传感器 X 轴值 前后摆动 俯仰角
- yvlaue： 重力传感器 Y 轴值 左右摆动 偏航角
- zvlaue： 重力传感器 Z 轴值 翅膀摆动 滚转角

ConnectBlueManager 参考

Overview

该类处理宏智力硬件与蓝牙设备之间的交互

Instance Property

蓝牙连接成功的回调

@property (nonatomic,copy)Blue3OrBlue4Connect blueConBlock;

蓝牙断开回调

@property (nonatomic,copy) BlueConnectdismiss blueDisBlock;

设备的数据回调

@property(nonatomic,copy)Blue3OrBlue4DataBlock hzlblueDataBlock;

蓝牙 3.0 设备连接状态

@property (nonatomic,assign)BOOL connected3;

蓝牙 3.0 设备连接状态

@property (nonatomic,assign)BOOL connected4;

Method

是否打印 log　默认不打印

+ (void)logEnable:(BOOL)enable;

初始化(单例)

+ (instancetype)shareInstance;

连接配置

参数说明：

blue3MFiOrBlue4Names: 可以连接的蓝牙 4.0 设备名称蓝牙 3.0 的 MFi

-(void)configureBlue3MFiOrBlue4Names:(NSArray *)blue3MFiOrBlue4Names；

连接蓝牙设备

-(void)connectBlue3OrBlue4;

断开蓝牙设备

-(void)disConnectBlue3OrBlue4;