

CS5530

Mobile/Wireless Systems

Bluetooth and Motion Sensor

Yanyan Zhuang

Department of Computer Science

<http://www.cs.uccs.edu/~yzhuang>

Overview

- Bluetooth
- Core Motion (accelerometer, etc.)
- Versions
 - Xcode version 7.x, 8.x
 - Swift version 2.x, 3.x
 - iOS version 8.x, 9.x, etc.
- Announcement
 - Office hour this Friday: 1-2pm
 - March 13: Guest lecture by Dr. Chow
 - Midterm: March 15/20/22



CoreBluetooth Framework

- Import the framework

- `import CoreBluetooth`

- Delegates

```
class ViewController: UIViewController,  
CBCentralManagerDelegate, CBPeripheralDelegate {  
    // Moar code  
}
```

- Declare manager

- `var manager: CBCentralManager!`



CoreBluetooth Framework

- Instantiate Manager

```
override func viewDidLoad() {  
    super.viewDidLoad()  
    manager = CBCentralManager(delegate: self, queue: nil,  
                                options: nil)  
}
```



CoreBluetooth Framework

- Check Bluetooth state

```
func centralManagerDidUpdateState(_ central: CBCentralManager){
    var mesg = ""
    switch(central.state){
    case .poweredOn:
        mesg = "BT is powered on"
        central.scanForPeripherals(withServices: nil, options: nil)
    case .....
    }
    print("\(mesg)")
}
```



CoreBluetooth Framework

- Scan for devices
 - `central.scanForPeripherals(withServices: nil, options: nil)`
- Display device information

```
func centralManager(_ central: CBCentralManager, didDiscover peripheral:
CBPeripheral, advertisementData: [String : Any], rssi RSSI: NSNumber)
```

```
{
    print("=====")
    print("\(peripheral.name)")
    print("\(peripheral.identifier)")
    print("RSSI: \(RSSI)dBm")
}
```

dBm: $X = 10\log_{10}P$ (P in mW)



Bluetooth Scan Result

=====

nil

XX

RSSI: -69dBm

=====

Bose Color II SoundLink

XX

RSSI: -70dBm

=====

nil

XX

RSSI: 127dBm

=====

Lots of nil's: during scan, BT doesn't have enough time to resolve name



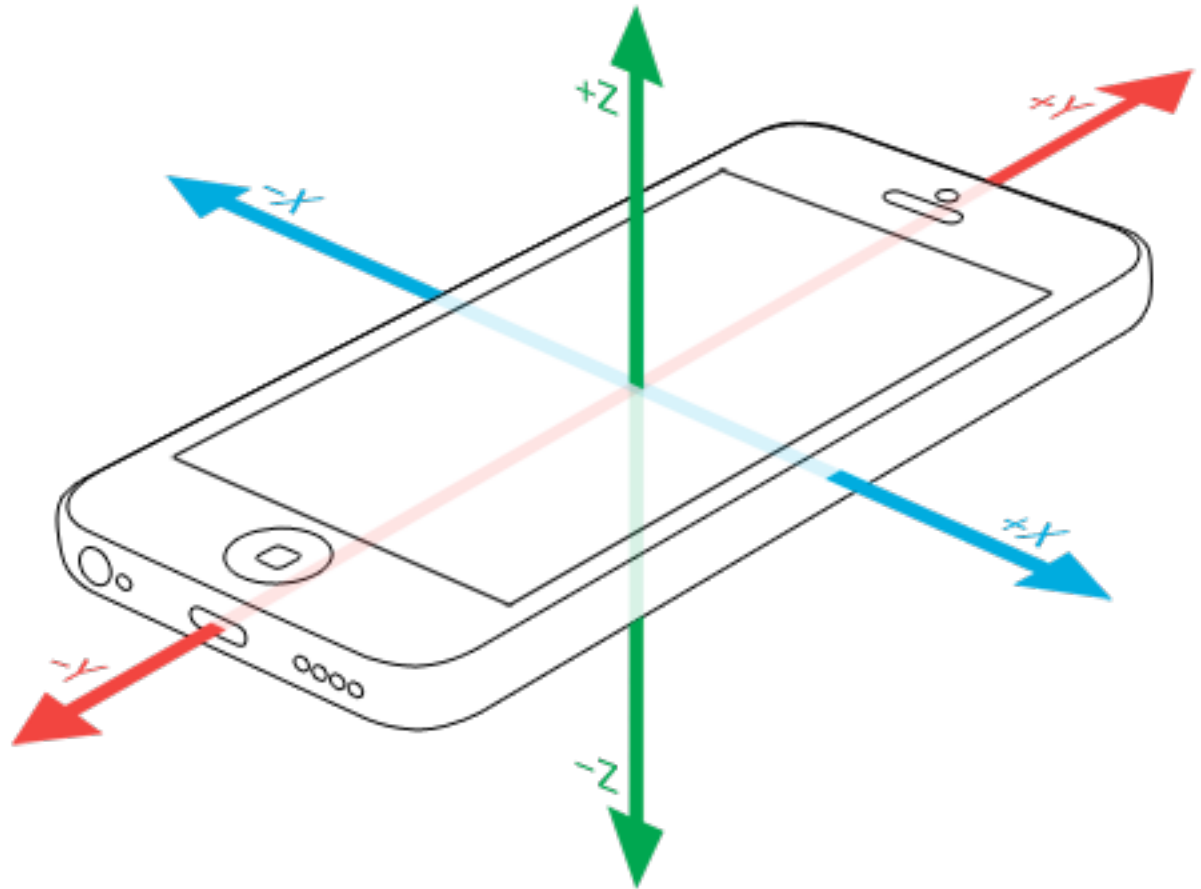
Bluetooth Scan Result

- UUID (Universal Unique Identifier)
 - Uniquely identify some object or entity on the Internet
 - A UUID is either guaranteed to be different or is, at least, extremely likely to be different from any other UUID generated until 3400 A.D



CoreMotion Framework

- Accelerometer example



CoreMotion Framework

- Import the framework
 - `import CoreMotion`
- Declare manager
 - `var motionManager: CMMotionManager!`
- Instantiate Manager (viewDidLoad or viewDidAppear)
 - `motionManager = CMMotionManager()`



CoreMotion Framework

- Set update interval
 - `motionManager.accelerometerUpdateInterval = 0.2`
- Start updating

```
motionManager.startAccelerometerUpdates(to:  
OperationQueue.current!,  
withHandler:{ (data, error) in  
    print(myData)  
}  
)
```



CoreMotion Framework

- Let's detect some motion

```
motionManager.startAccelerometerUpdates(to:
OperationQueue.current!,
withHandler:{ (data, error) in
    if let myData = data {
        let x = myData.acceleration.x
        if x > 2 || x < -2 {
            print(myData)
        }
    }
})
```



Notes

- APIs very likely to be changed
 - Example: `func centralManagerDidUpdateState(central: CBCentralManager)` changed to `func centralManagerDidUpdateState(_ central: CBCentralManager)`
 - Some changes every few months... you need to keep up with it! 😞

