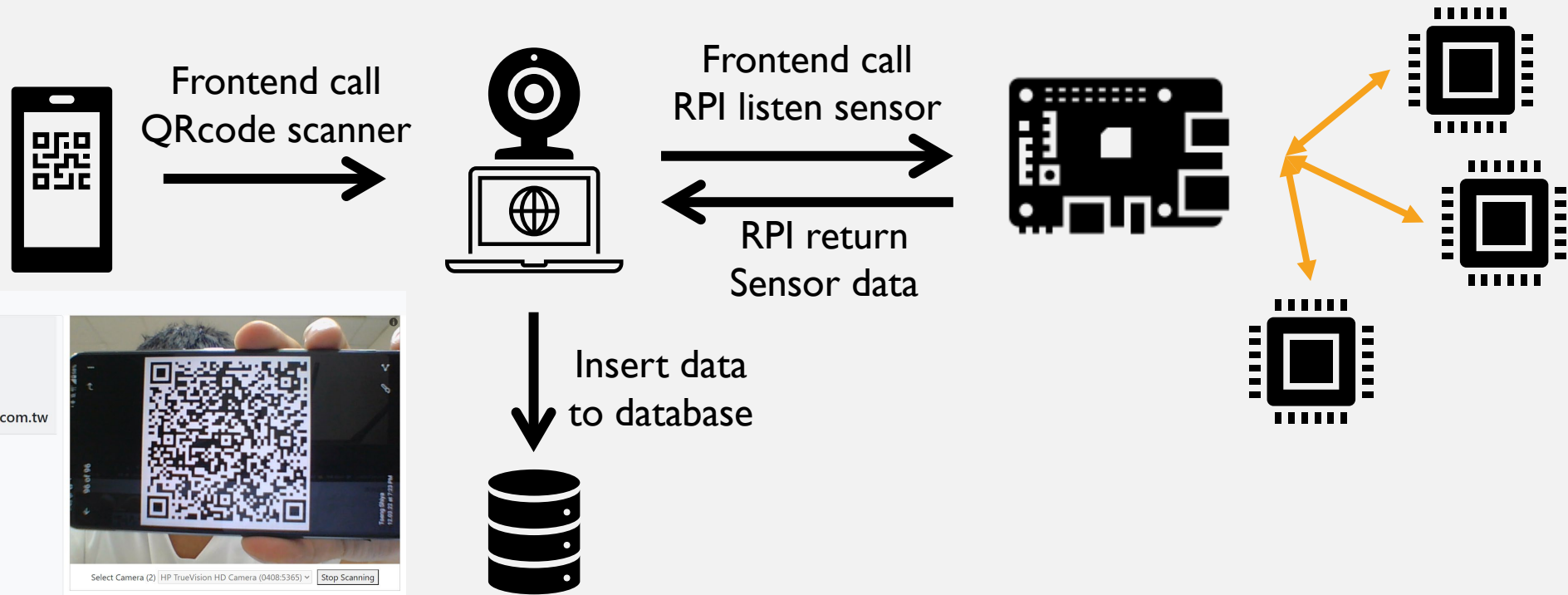


# HEALTH CARE SYSTEM

(SECTION OF SENSOR)

F110156105曾厚荃

# SYSTEM FLOW



人員體溫檢測

姓名： 華\*聯  
手機： 0912\*\*\*678  
生日： 2019-08-24  
性別： male  
電子信箱： steven\_tsai@huakai.com.tw

體溫：  
體重：  
血氧：  
脈搏：  
收縮壓：  
舒張壓：



# FDK300 額溫槍

額溫資訊在  
service0020/char0023

```
import subprocess

class FDK300:
    def __init__(self):
        self.cmd = ''
        { printf 'scan on\n\n'
          printf 'connect C6:05:04:07:4D:54\n\n'
          printf 'menu gatt\n\n'
          printf 'select-attribute /org/bluez/hci0/dev_C6_05_04_07_4D_54/service0020/char0023\n\n'
          printf 'read\n\n'
          printf '\n\n'
          sleep 3
        } | bluetoothctl

    def get_sensor_data(self):
        proc = subprocess.Popen(self.cmd, shell=True, stdout=subprocess.PIPE)
```

<https://gist.github.com/tsenghc/0b7f9fbacd7ba21df395a1217ef79739>

## FDK300額溫槍封包解析

- 切到對應目錄讀取資料
- 資料只存在於語音播報期間
- 資料精度到小數二位
- 語音播報完畢體溫數據會release
- $\text{HEX}(0d33) = \text{DEC}(3379)/100 = 33.79^\circ\text{C}$
- $\text{HEX}(55aa) =$  資料不存在

```
[FDK300.4]# select-attribute /org/bluez/hci0/dev_C6_05_04_07_4D_54/service0020/char0023
[FDK300.4:/service0020/char0023]# read
Attempting to read /org/bluez/hci0/dev_C6_05_04_07_4D_54/service0020/char0023
[CHG] Attribute /org/bluez/hci0/dev_C6_05_04_07_4D_54/service0020/char0023 Value:
fe 6a 72 5a 0d 33 00 76 .jrZ.3.v
fe 6a 72 5a 0d 33 00 76 .jrZ.3.v
[FDK300.4:/service0020/char0023]# read
Attempting to read /org/bluez/hci0/dev_C6_05_04_07_4D_54/service0020/char0023
[CHG] Attribute /org/bluez/hci0/dev_C6_05_04_07_4D_54/service0020/char0023 Value:
fe 6a 72 5a 0d 33 00 76 .jrZ.3.v
fe 6a 72 5a 0d 33 00 76 .jrZ.3.v
[DEL] Device C6:05:04:07:4D:54:1D:CE:FA 52-95-9A-1D-CE-FA
[FDK300.4:/service0020/char0023]# read
Attempting to read /org/bluez/hci0/dev_C6_05_04_07_4D_54/service0020/char0023
[CHG] Attribute /org/bluez/hci0/dev_C6_05_04_07_4D_54/service0020/char0023 Value:
fe 6a 72 5a 55 aa 0b f0 .jrZU...
fe 6a 72 5a 55 aa 0b f0 .jrZU...
```

# FDK400血壓計

血壓資訊在  
service0021/char0022

```
import subprocess

class FDK400:
    def __init__(self):
        self.cmd = ''
        { printf 'scan on\n\n'
          printf 'connect 07:B3:EC:03:99:BE\n\n'
          printf 'menu gatt\n\n'
          printf 'select-attribute /org/bluez/hci0/dev_07_B3_EC_03_99_BE/service0021/char0022\n\n'
          printf 'read\n\n'
          printf '\n\n'
          sleep 1
        } | bluetoothctl

    ...
```

<https://gist.github.com/tsenghc/0ec9ce924aa59a7800cd02e8b81c9713>

## FDK400血壓計封包解析

### 五・發送測試結果(0X55)

血壓計發送測試結果：**FF FE 0A C3 21 55 00 8C 00 58 5F 00**

解析：**FF FE**：引導碼

**0A**:長度碼

**C3**：校驗和

**21**：血壓計固定值

**55**：命令碼

測試結果為：高壓：**140mmHg**；低壓：**88mmHg**；脈搏：**95 次**；

**0x00** 無心率不齊

**0x11** 心率不齊。

# MI70血氧計

血壓資訊在  
service001f/char0020

```
import subprocess

class M170:
    def __init__(self):
        self.cmd = ''
        { printf 'scan on\n\n'
          printf 'connect C8:DF:84:37:B4:D8\n\n'
          printf 'menu gatt\n\n'
          printf 'select-attribute /org/bluez/hci0/dev_C8_DF_84_37_B4_D8/service001f/char0020\n\n'
          printf 'notify on\n\n'
          printf '\n\n'
          sleep 7
          printf 'disconnect\n\n'
        } | bluetoothctl

    ...
```

<https://gist.github.com/tsenghc/0cbbff3f818aa5bc8cb37a050552bbd1>

## MI70血氧計封包解析

二：血氧饱和度和脉率数据（每秒发送一个数据包，每个包有4字节数据）

0xFE 0x6A 0x76 0x52 0x04 D0 D1 D2 D3 CS。

0xFE：帧头

0x6A：蓝牙通讯方式

0x76：血氧仪

0x52：血氧饱和度和脉率数据

0x04：数据长度 4 个字节

D0：包类型，bit0=1;bit1=0;

D1：脉率 bit0—bit7。

D2：血氧饱和度，单位%，数值在 35—100。127 为无效值，无效值可以显示成“——”。

D3：PI 指数，0—200，255 为无效值。

CS：累计和校验



# MTKAI 體重計

該體重機採用bluetooth advertising，使用bluetoothctl開啟掃描後監聽並解析即可

```
import subprocess

class MTKA1:
    def __init__(self):
        self.find_data = False
        self.cmd = ''
        { printf 'scan on\n\n'
          printf '\n\n'
          sleep 30
          printf 'quit\n\n'
        } | bluetoothctl
        ...

    def get_sensor_data(self):
        proc = subprocess.Popen(self.cmd, shell=True, stdout=subprocess.PIPE)
```

<https://gist.github.com/tsenghc/daef96529d2c33ed227adbe598bd8300>

## MTKAI 體重計封包解析

- 開啟掃描並監聽
- 資料精度到小數一位
- $\text{HEX}(57) = \text{DEC}(87)/10 = 8.7\text{KG}$
- $\text{HEX}(013b) = \text{DEC}(315)/10 = 31.5\text{KG}$

```
pi@raspberrypi:~ $ bluetoothctl
Agent registered
[bluetooth]# scan on
Discovery started
[CHG] Controller B8:27:EB:4B:AF:29 Discovering: yes
[NEW] Device 7F:F3:D2:54:93:76 7F-F3-D2-54-93-76
[NEW] Device 68:64:4B:0F:36:22 68-64-4B-0F-36-22
[NEW] Device 52:DA:7A:89:1C:82 52-DA-7A-89-1C-82
[NEW] Device A4:C1:38:E1:94:82 LYWSD03MMC
[NEW] Device EC:98:7C:89:82:7D EC-98-7C-89-82-7D
[NEW] Device 6A:79:F4:76:D4:50 6A-79-F4-76-D4-50
[NEW] Device F2:F0:42:87:EB:67 F2-F0-42-87-EB-67
[NEW] Device DA:1C:2B:80:91:1D realme Watch
[NEW] Device 6D:97:40:33:34:D0 6D-97-40-33-34-D0
[CHG] Device 6D:97:40:33:34:D0 ManufacturerData Key: 0x20ca
[CHG] Device 6D:97:40:33:34:D0 ManufacturerData Value:
0b 12 12 12 12 01 01 3f 00 57 00 00 43 6d 97 40 .....?.W..Cm.@
33 34 d0 34.

[CHG] Device 6D:97:40:33:34:D0 ManufacturerData Value:
0b 12 12 12 12 01 01 40 01 3b 13 96 d5 6d 97 40 .....A.;...m.@
33 34 d0 34.
```