智能宿舍解决方案

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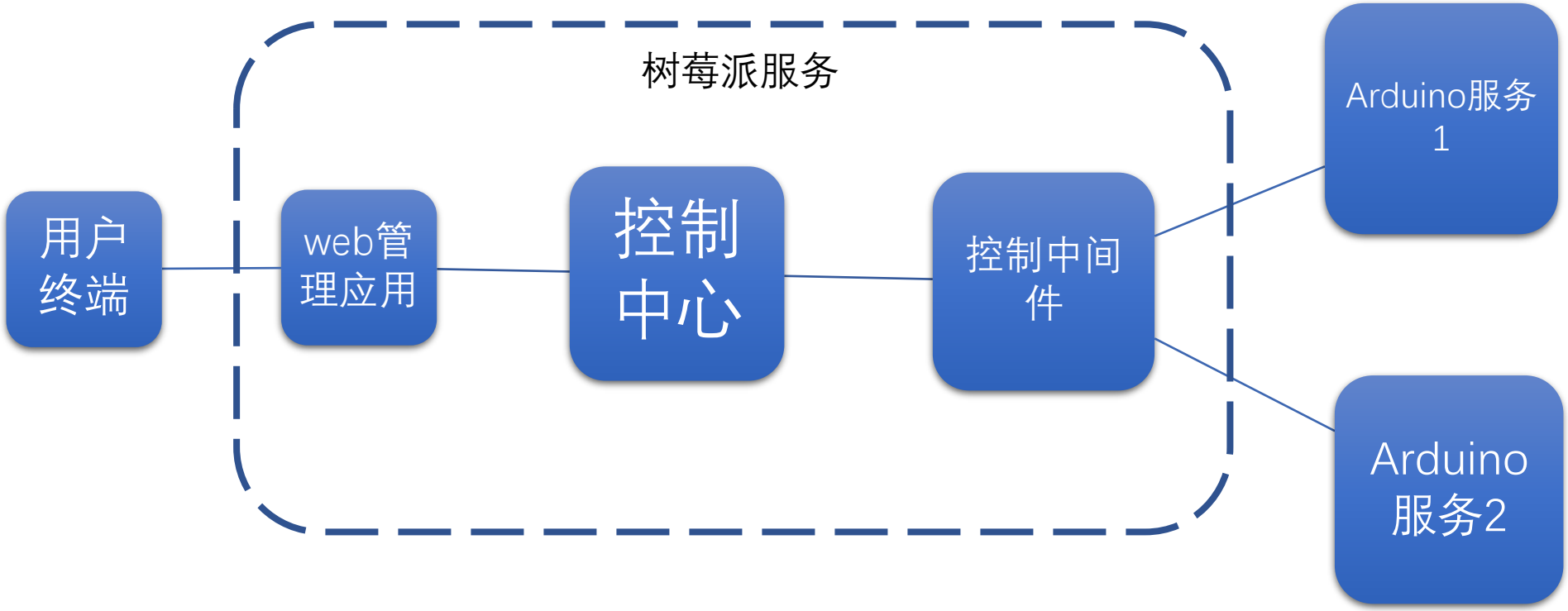
项目分析

- 特征：可用性、可修改性、可测试性

- 实例：
  - 智能灯控
  - 自动浇水
  - 久坐提醒

整体架构

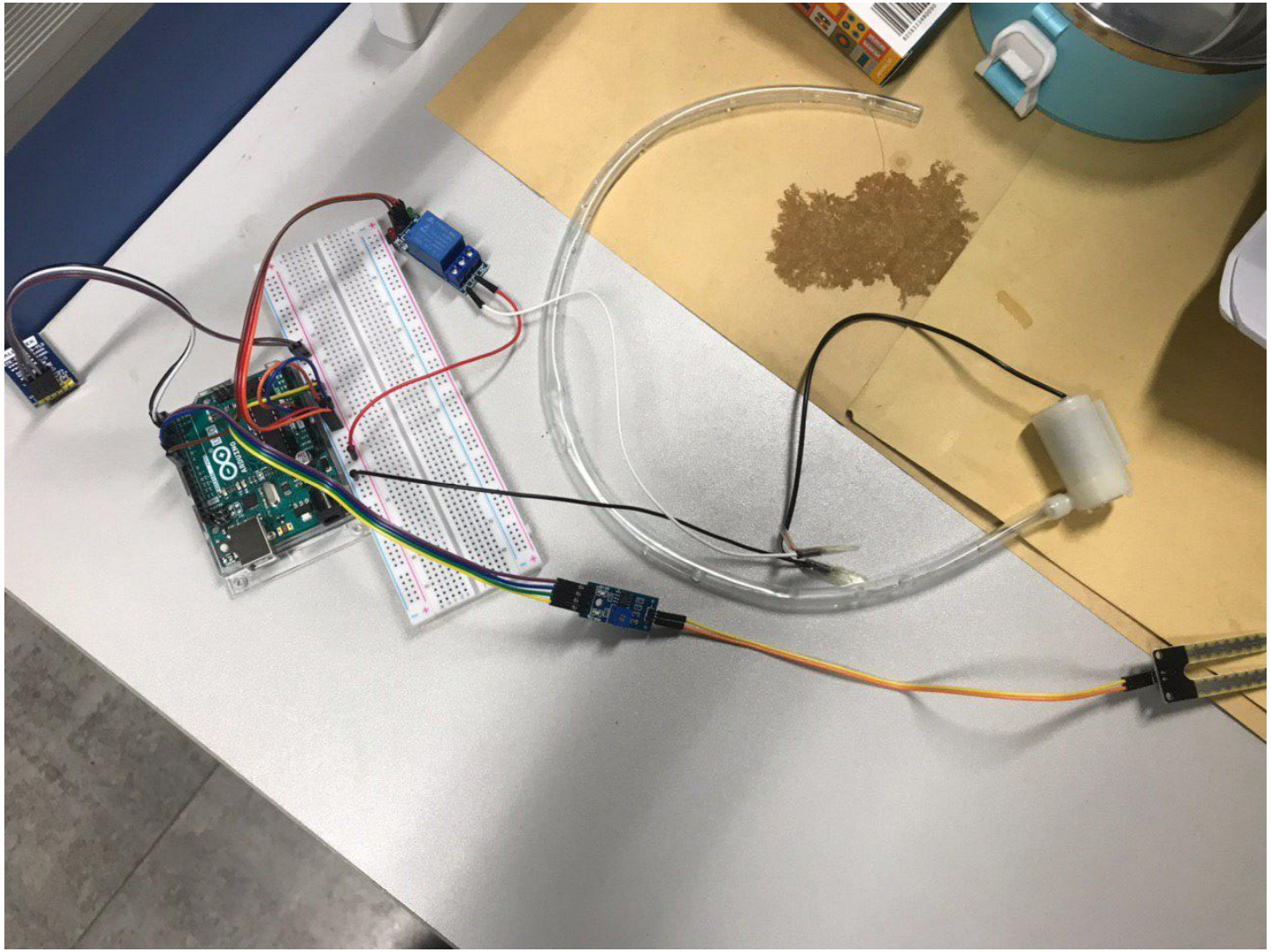


模块测试与Arduino实例开发

This branch is 4 commits ahead of oxalica:master. Pull request Compare

TzeHimSung Merge branch 'master' of github.com:oxalica/phy-toy Latest commit fd9dde7 1 hour ago

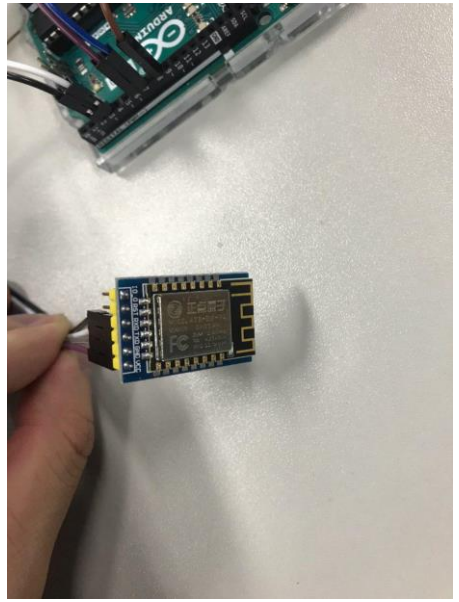
..		
Beep	Update phy-toy document	16 hours ago
DHT11	Update basic module demo	2 days ago
ESP8266	Update basic module demo	2 days ago
HC-SR501	Update basic module demo	2 days ago
HW-069	Update basic module demo	2 days ago
I2C_Scanner	Update basic module demo	2 days ago
LCD1602	Update basic module demo	2 days ago
Light-module	Update basic module demo	2 days ago
MSQC6412C	Update basic module demo	2 days ago
Sound-module	Update basic module demo	2 days ago
Watering	Update watering module	21 hours ago
libraries/src	finish arduino control and rpi interface	9 hours ago
wifi-light	finish arduino control and rpi interface	9 hours ago
wifi-plant	finish arduino control and rpi interface	9 hours ago
wifi-seat	finish arduino control and rpi interface	9 hours ago
.gitkeep	Move fe-server to sub-dir	2 days ago

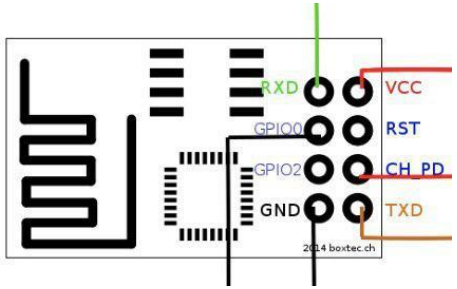


开发板通信

- 目的
  - 保持后端对模块的监测和控制
- 硬件支持
  - ESP8266 wifi模块
  - AR750s 路由器
  - 树莓派3B+ 板载wifi
- 软件支持
  - 基于ESP8266的AT指令集
  - Python3 socket json库
  - Linux shell netcat命令（调试用）

ESP8266与AT指令集





序号	名称
1	VCC
2	GND
3	TXD
4	RXD
5	RST
6	IO-0

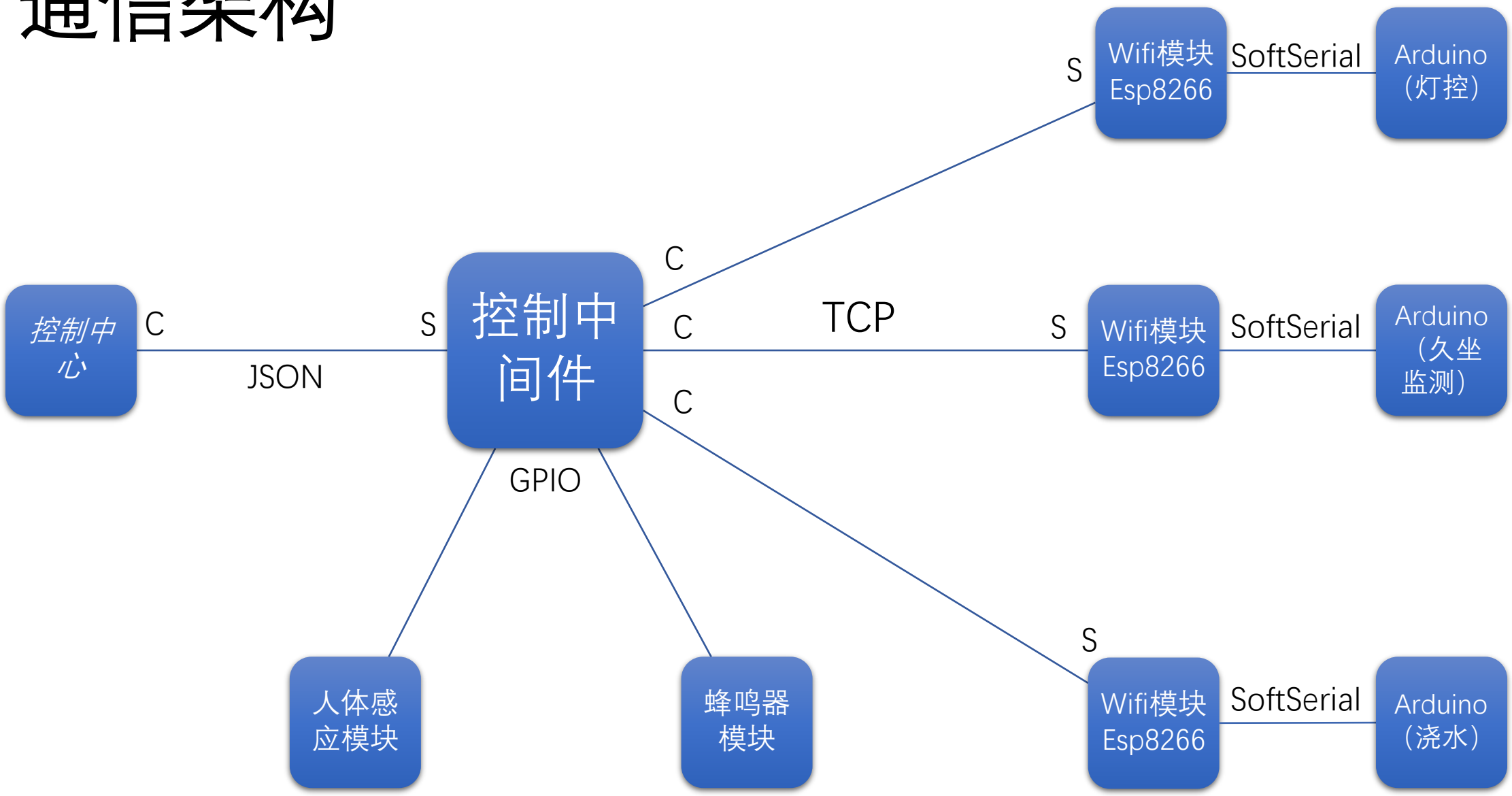
TCP/IP 功能 AT 指令

TCP/IP 指令一览表

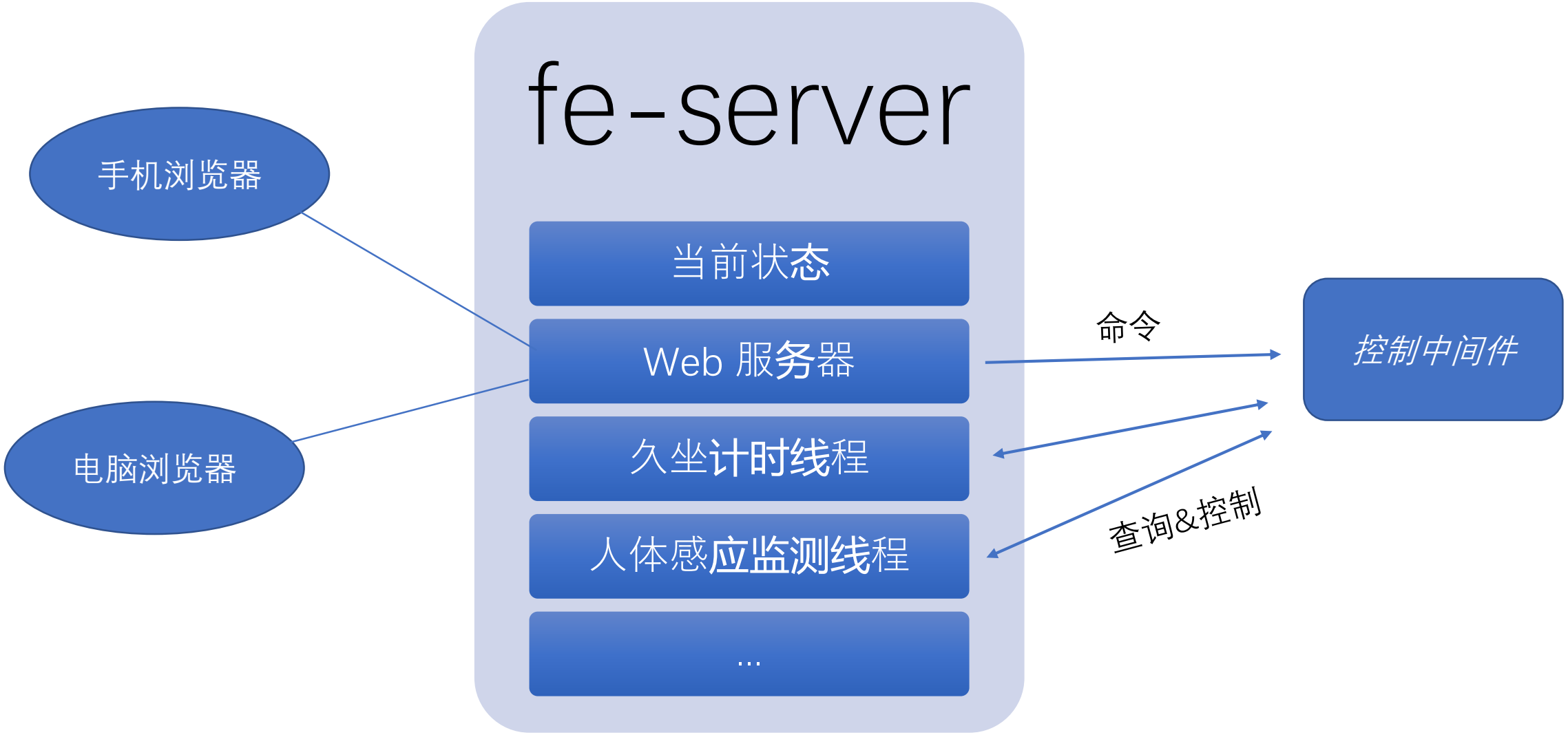
指令	描述
AT+CIPSTATUS	查询网络连接信息
AT+CIPDOMAIN	域名解析功能
AT+CIPSTART	建立 TCP 连接，UDP 传输或者 SSL 连接
AT+CIPSSLSIZE	设置 SSL buffer 大小
AT+CIPSSLCCONF	配置 ESP SSL client
AT+CIPSEND	发送数据
AT+CIPSENDEX	发送数据，达到设置长度，或者遇到字符 \0，则发送数据
AT+CIPSENDBUF	数据写入 TCP 发包缓存
AT+CIPBUFRESET	重置计数（TCP 发包缓存）

……

通信架构


控制中心
C
JSON
S
控制中间件
C
C
C
TCP
S
Wifi模块 Esp8266
SoftSerial
Arduino（灯控）
S
Wifi模块 Esp8266
SoftSerial
Arduino（久坐监测）
S
Wifi模块 Esp8266
SoftSerial
Arduino（浇水）
GPIO
人体感应模块
蜂鸣器模块

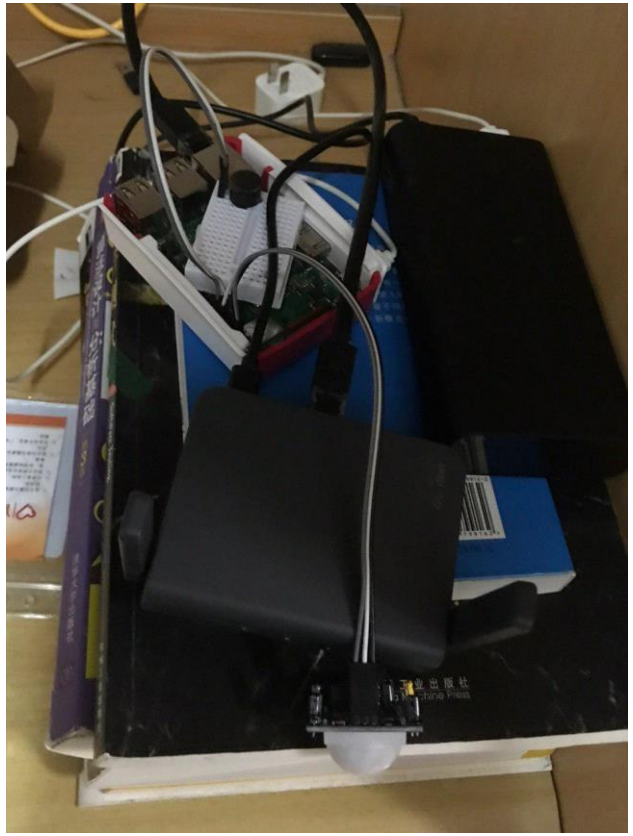
控制系统与 Web 服务器

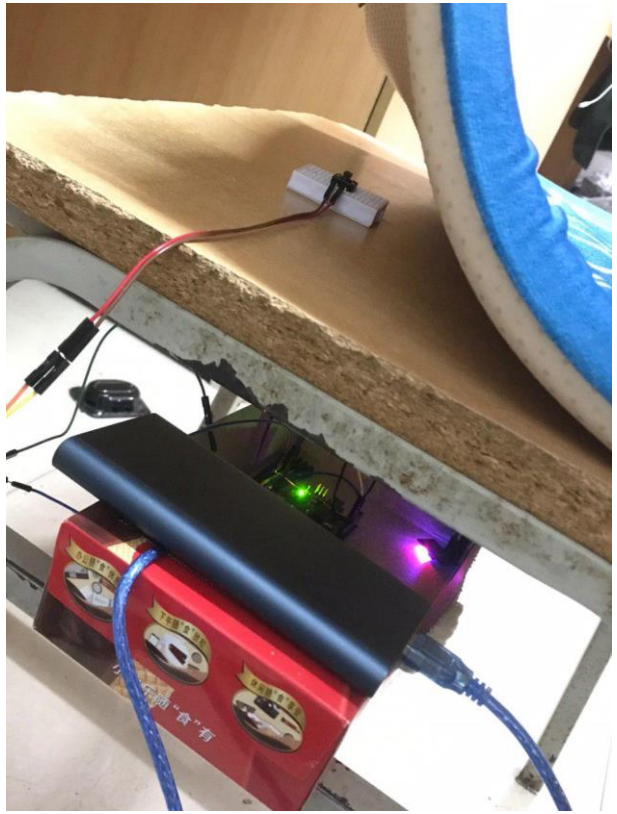


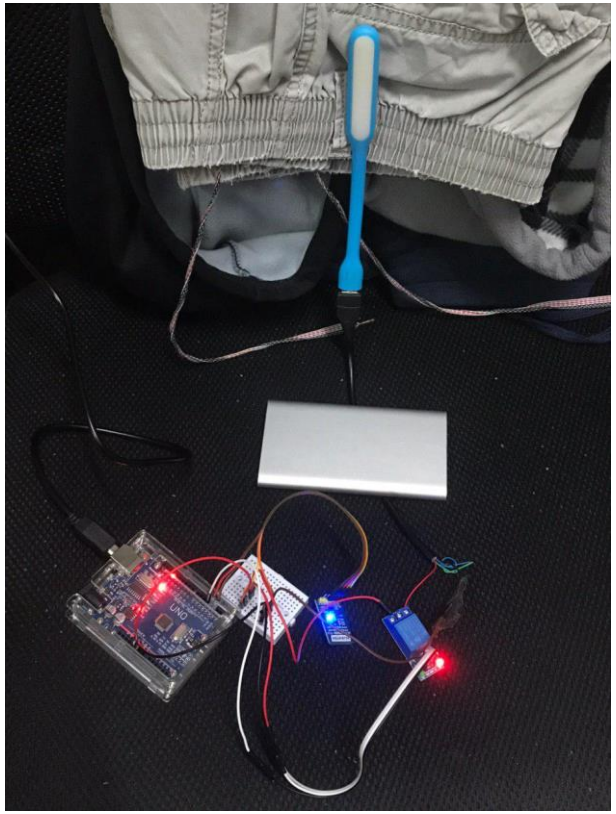
控制中心前端

```
Requests per second:    10332.39 [#/sec] (mean)
Time per request:       96.783 [ms] (mean)
Time per request:       0.097 [ms] (mean, across all concurrent requests)
Transfer rate:          35416.70 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   40   5.1     40      58
Processing:    18   57   8.8     58     112
Waiting:        0   43   9.6     47      77
Total:         53   96   6.7     97     134

Percentage of the requests served within a certain time (ms)
  50%     97
  66%     99
  75%    101
  80%    102
  90%    104
  95%    106
  98%    109
  99%    110
 100%    134 (longest request)
```

Demo show







Thanks for listening