

Internet of Things, CS 244P

Project Title: Basic Health monitoring system, using IOT

Team members:

TEAM #7

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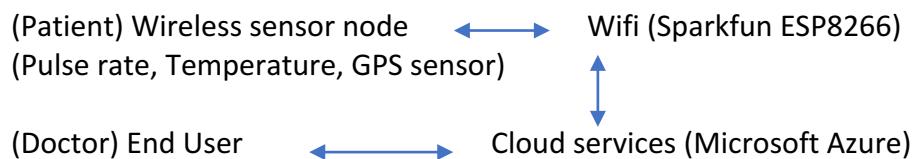
Introduction:

We plan to design a basic health monitoring system to record health related data of patients, who might be busy in their daily schedules and do not get enough time to go for regular health checkups. This system is created on an IOT platform. It captures patient's location and health parameters like heart rate and body temperature. The data captured is sent to the cloud server, from where the doctor in-charge can access it. The system also has the feature of glowing an LED (on patient's end) and giving an alert message (on doctor's end), in case pulse rate become abnormal. Upon receiving this alert, the doctor can use the location provided by our GPS sensor and immediately attend to the patient. We have integrated the feature of Google Maps for using to reach the location.

Architecture:

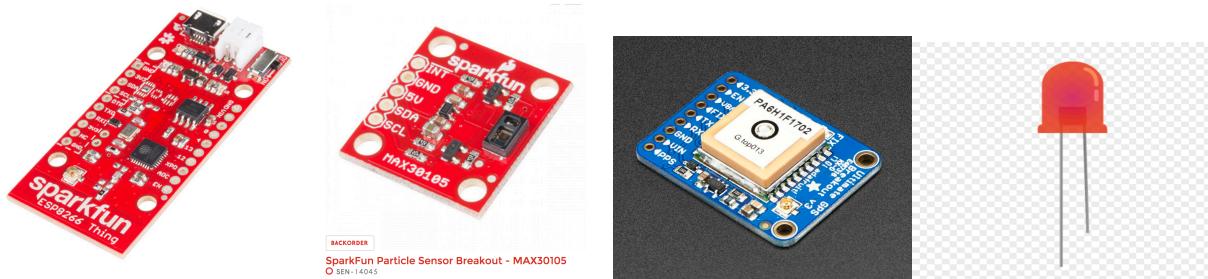
*WIFI Wireless protocol

*Sensor-Cloud (Architecture 2)



COMPONENTS USED:

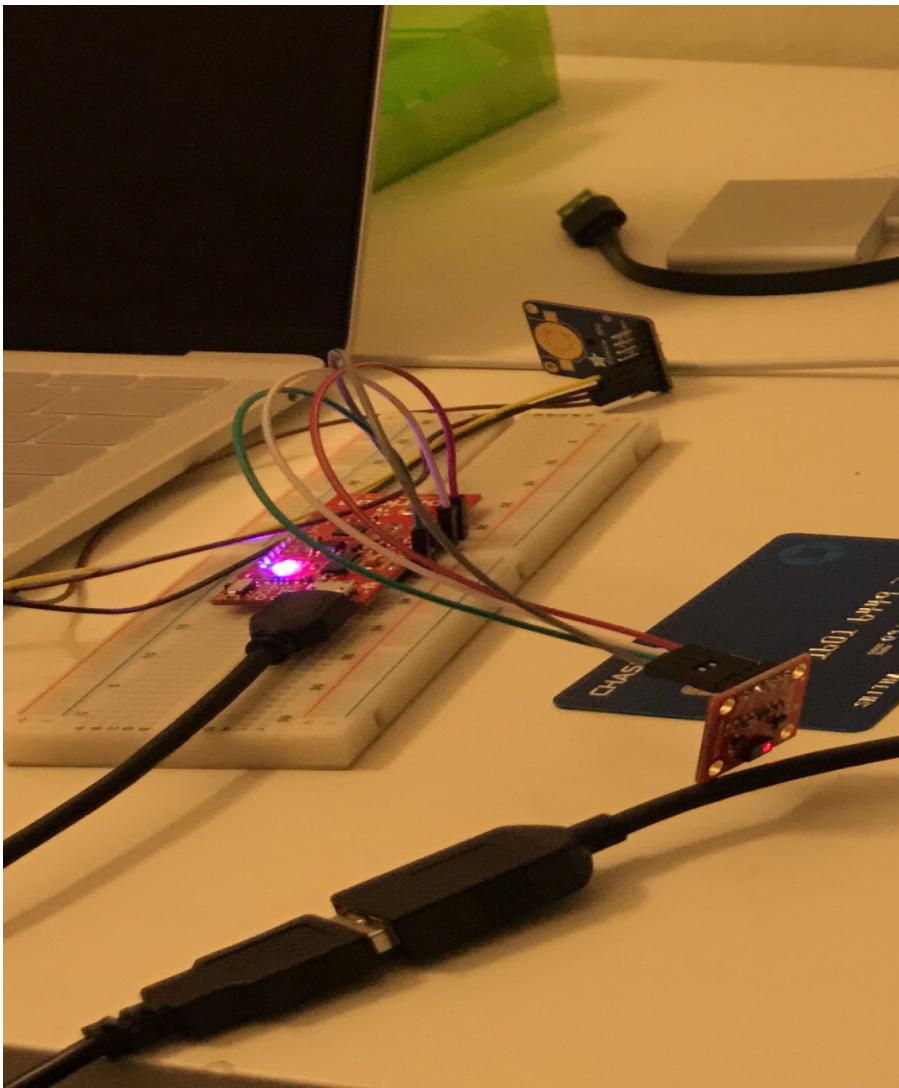
S.No	Name	Qty.
1	Wifi Module – ESP8266	1
2	Pulse Rate sensor MAX 30105	1
3	Adafruit Ultimate GPS Breakout	1
4	LED bulb	1



BASIC PROJECT WORKFLOW:

Patient's end (Client side):

The setup at the end of the client includes all sensors: Pulse rate sensor, Body temperature sensor and GPS sensors. These sensors continuously sense the patient's health parameters like pulse rate (Beats per minute) and Body temperature (degree Celsius) and also patient's location is tracked through GPS sensor. The data from these sensors is continuously sent over cloud to the doctor's end.



CLOUD SERVER (Microsoft Azure):

We are sending data from patient's end to the Azure server, where we have hosted our web application. Our device is registered at the server and using our IOT Hub's connection key and Device registration connection key, we are making connection between our local system and remote server.

Microsoft Azure projFinal

projFinal App Service

Resource group (change)
projFinal

Status
Running

Location
Central US

Subscription (change)
Free Trial

Subscription ID
9cb4ce5b-7b38-40be-afa1-28b11d1bb91b

Browse **Stop** **Swap** **Restart** **Delete** **Get publish profile** **Reset publish profile**

URL
<http://projfinal.azurewebsites.net>

App Service plan/pricing tier
ServicePlan929af1d6-80e9 (Standard: 1 Small)

Git/Deployment username
gitRepoF

Git clone url
<https://gitRepoF@projfinal.scm.azurewebsites.net:443/projFinal.git>

FTP hostname
<ftp://waws-prod-dm-035.ftp.azurewebsites.windows.net>

OS name
Windows Server 2012

Http 5xx

100
80
60
40
20
0

3:45 PM 4 PM 4:15 PM 4:30 PM

HTTP SERVER ERRORS 0

Data In

4kB
3kB
2kB
1kB
0kB

3:45 PM 4 PM 4:15 PM 4:30 PM

DATA IN 5.45 kB

Data Out

3kB
2.5kB
...

Microsoft Azure ShefaliUCI - IoT Devices > Device Details

ShefaliUCI - IoT Devices

IoT Hub

Overview

Activity log

Access control (IAM)

SETTINGS

Shared access policies

Pricing and scale

Operations monitoring

IP Filter

Certificates

Properties

Locks

Automation script

EXPLORERS

IoT Devices (selected)

IoT Edge (preview)

Query Explorer

Device Details

MysparkFun

Device Id MysparkFun

Primary key 4Fc4KhJyJsPMViBvXsfnn8IXE02xleOIPG+IPIHYKU=

Secondary key +UBoHR2BN46ixFTujEDETluCzWuA2Z9/UsaYflIp70=

Connection string—primary key HostName=ShefaliUCI.azure-devices.net;DeviceId=MysparkFun;SharedAccessKey=4Fc4KhJyJsPMVi...

Connection string—secondary key HostName=ShefaliUCI.azure-devices.net;DeviceId=MysparkFun;SharedAccessKey=+UBoHR2BN46ix...

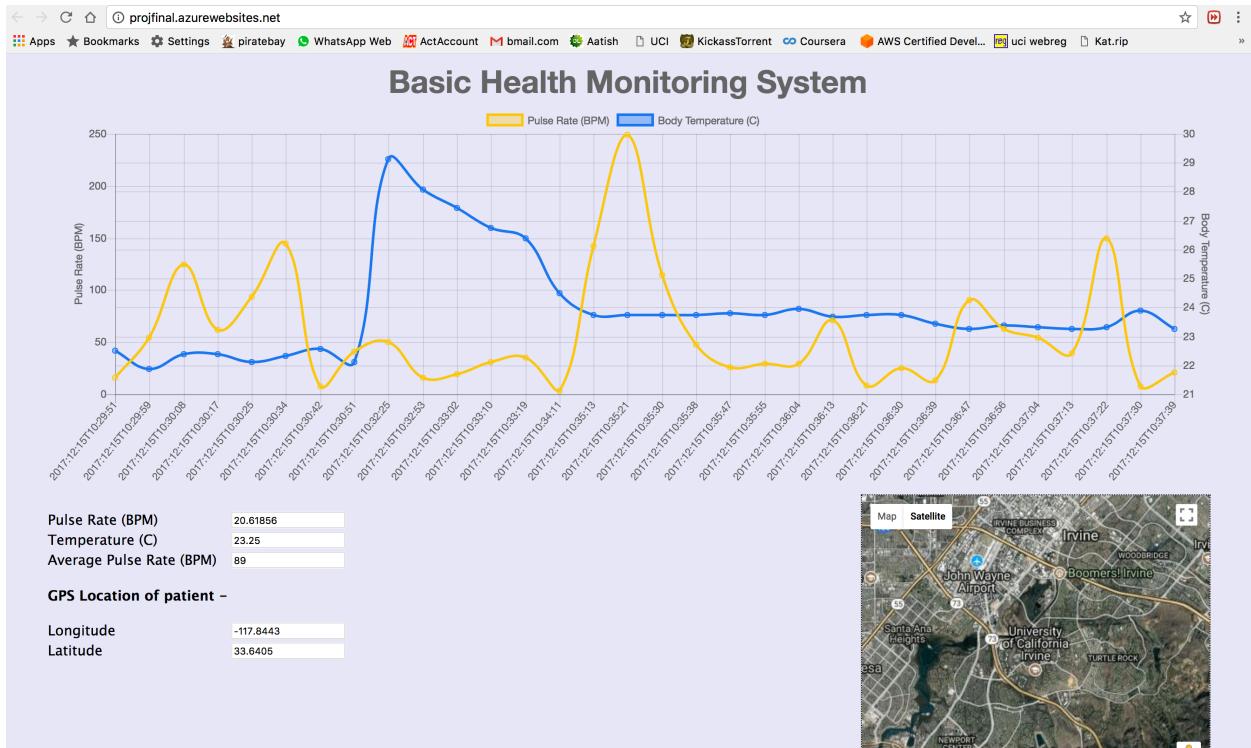
Connect device to IoT Hub **Enable** **Disable**

DOCTOR'S END (Server side):

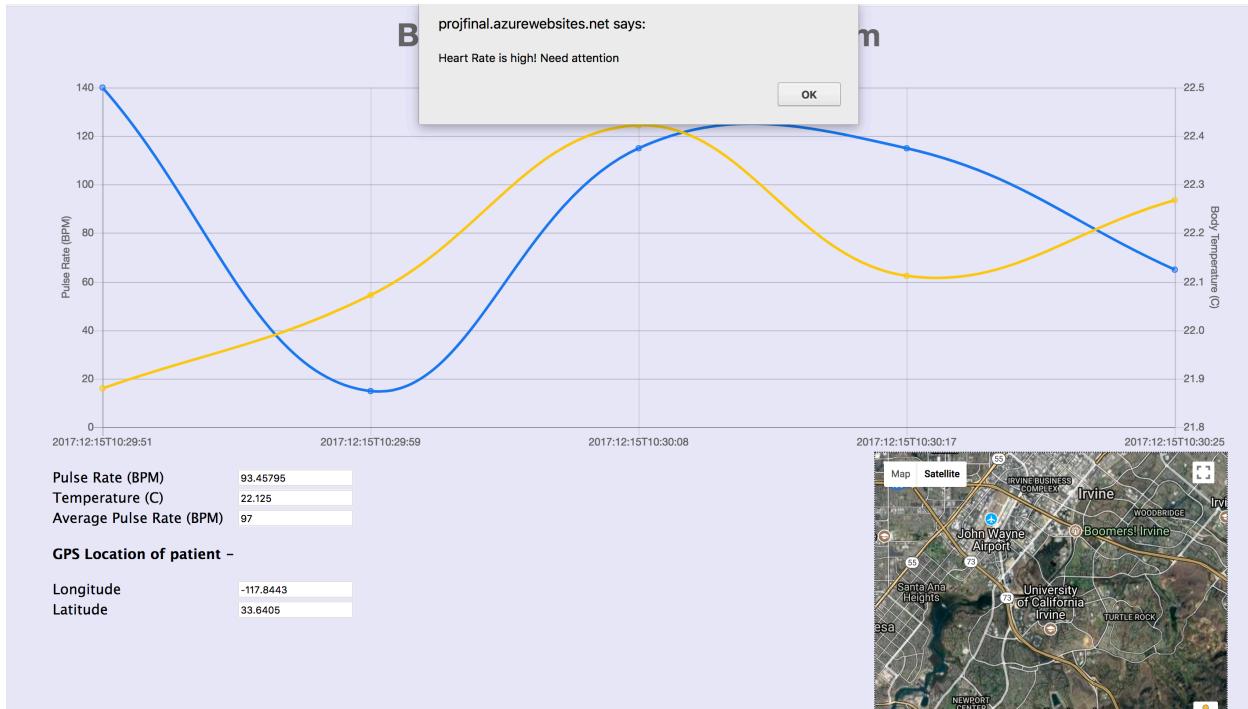
The doctor is able to continuously monitor the real-time data of patient's health parameters (Pulse rate, body temperature, GPS location). In our project, we have set a pulse rate threshold

value of 100, i.e. if the pulse rate of the patient shall exceed 100, the doctor will get an alert (in form of alert box) on his window. Also, on the side of the patient an LED bulb shall glow, indicating this abnormal parameter.

(Dashboard at Doctor's end)



When pulse rate reaching threshold, alert pops up



CONCLUSION:

In our project, we are able to demonstrate a basic setup of health monitoring over a remote location, using the concepts learnt from Internet of things. In this, we have shown how if certain sensors are placed over a patient's body, his doctor can continuously monitor his health parameters from a remote location.

Benefits:

- This reduces the requirement for a patient to be continuously present over the doctor's site (hospital etc.) and can easily capture health data from patient's location.
- In case the patient is forgetful about his health, or is too busy to visit the doctor, or wishes to avoid negligence, he can use such a system to have continuous monitoring of his health parameters, thus, helping him achieve his doctor's attention at the right time.

REFERENCES:

- [MAX 30105 Pulse Ox sensor guide](#)
- [Adafruit Ultimate GPS guide](#)
- [Microsoft Azure tutorials](#)
- [CS 244P Demo](#)