

# IoT-based Wireless Sensor Network for Patient Care

TEAM #68

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Project for: Northern Illinois University

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## Abstract

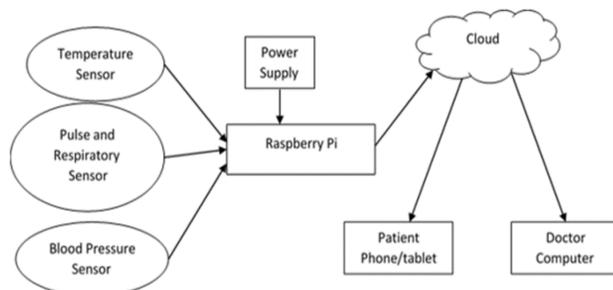
IoT and cloud computing are the prime objective of the current design project and development in the field of healthcare. In this project, an attempt is made to enhance the integration of wireless sensor network in IoT environment with cloud computing for health care system. IoT is a dynamic network infrastructure, that interconnects different sensor networks through Internet, acquire sensor data/information, transmit and receives data/information for further processing. The related sensed data/information will be sent for the necessary information exchange together with the design and optimized parameters



## Introduction

### Objective :

1. Low cost, portable easy to use device to monitor vital sign
2. Transmit data via Bluetooth
3. Gather sensor readings such as temperature, oxygen rate, blood pressure and heart rate and send to cloud network



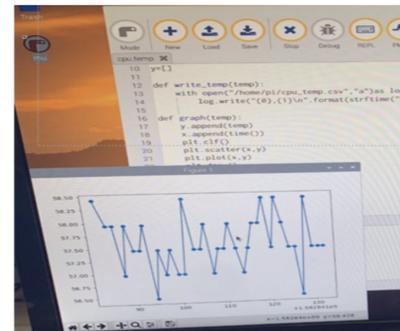
## Methods and Materials

**Design Features:** Raspberry Pi 4 controller with up to 4GB RAM, a faster quad-core CPU, support for dual displays at up to 4K resolution, Gigabit Ethernet, USB3.0, wireless LAN and Bluetooth 5.0 connected via Bluetooth to temperature sensor, heart rate sensor and blood pressure sensor.



### GUI Design Live Graphing (matplotlib) / Bluetooth connection :

Used Python programming to develop code which will execute various functions, such as live graphing and Bluetooth connection of the device when powered allowing active transfer of readings when device is being used.



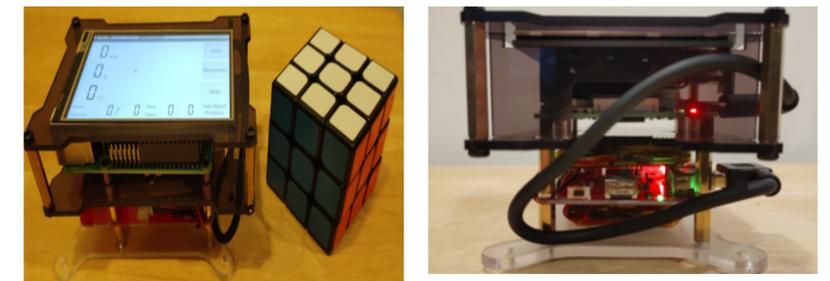
```
1 #David Dominguez
2 #Created on 3/2/20
3 #Last updated on 3/5/20
4 #Connecting to sensor
5 import binascii
6 import struct
7 import time
8 from bluepy import btle
9
10 print "Connecting..."
11 #dev = btle.Peripheral("d4:ea:e4:33:15:3a") #pulse
12 dev = btle.Peripheral("00:9d:6b:71:b4:46") #BP
13
14 print "Services..."
15 for svc in dev.services:
16     print str(svc)
17
18 print "Characteristics..."
19 for ch in dev.getCharacteristics():
20     print str(ch)
21     if (ch.supportsRead()):
22         val = binascii.b2a_hex(ch.read())
23         val = binascii.unhexlify(val)
24         #val = struct.unpack('f',val)
25         print str(val)
26         time.sleep(1)
```

### GUI Design:

Created in python PyQt5 window/Qt Designer using python programming language

## Discussion/Results

The image below shows the device without its case turned on with the functioning user interface and size comparison to a rubrics cube and also the side view.



## Conclusions

The main goal of this project is to show how important artificial intelligence is to human lives and how significantly improve our lives. The device makes use of multiple wearable sensors capable of reading important vital signs, such as blood pressure, heart rate, respiratory rate, and temperature that communicate information with small computer board, that can then send the information to the cloud wirelessly. IoTSNPC will allow users to have a greater knowledge of their health and allow them to take necessary precautions to improve their health in the comfort of their homes.

## Acknowledgements

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