

IoT Based Patient Health Monitoring



16th April, 2018

Supervisor
Miss Rafia Hassan

Group Members
Hadi Ahmed (01-133142-172)

Muhammad Osama Shafique (01-133142-186)

Software Engineering Department

Bahria University, Islamabad

ABSTRACT

Monitoring our loved ones all the time is a difficult now a days. Especially when we are at work and we need to monitor our patients at home (especially old ones), we always wants to be informed about their health status time to time. So we have propose an innovative system that automated this task with ease. The purpose of this project is to deliver an IoT based smart patient health monitoring system that uses various sensors to keep the track of patient's health and uses internet to inform their relatives/doctors in case of any emergency. It is an Arduino based system which collects patient's health information with the help of three sensors: Temperature, Pulse and Blood Pressure. The system also comprises of a mobile application that is utilized by the users for monitoring their patient (s) 24/7 through the application features. If system detects any anomalies in patient body temperature, pulse or blood pressure it automatically alerts the user about the patient's status over IoT and shows all the details live over the Internet.

Table of Contents

Contents

Contents	6
1 INTRODUCTION	2
1.1 Project Overview	2
1.2 Motivation	2
1.3 Problem Statement	2
1.4 Goals/Objectives	2
1.5 Main Contribution	3
1.5.1 New, different, better and significant:.....	3
1.5.2 Importance in Real World	3
1.6 Thesis Organization	3
2 BACKGROUND/LITERATURE REVIEW	5
2.1 Usage of IoT in Medical Field:.....	5
2.2 Secured Smart Healthcare Monitoring System Based on IoT:.....	5
2.3 Patient Health Monitoring System using IOT and Android:.....	6
2.4 Patient Health Monitoring System using IOT:	6
3 System Requirements	8
3.1 Interface Requirement.....	8
3.1.1 User Interface	8
3.1.2 Software Interface.....	8
3.2 Functional Requirements	8
3.2.1 Functional Requirement#01: Sign up.....	8
3.2.2 Functional Requirement#02: Sign in.....	8
3.2.3 Functional Requirement#03: Add Guardian.....	8
3.2.4 Functional Requirement#04: Remove Guardian	9
3.2.5 Functional Requirement#05: Add Doctor	9
3.2.6 Functional Requirement#06: Remove Doctor	9
3.2.7 Functional Requirement#07: Remove Patient.....	9
3.2.8 Functional Requirement#08: View Body Temperature	9
3.2.9 Functional Requirement#09: View Heart Rate	9
3.2.10 Functional Requirement#10: View Blood Pressure	9

3.3 Use cases (use case description)	10
3.3.1 Use case: System use case	10
3.3.2 Use Case#01: Sign up.....	11
3.3.3 Use Case: Sign in	12
3.3.4 Use Case: Add Guardian.....	13
3.3.5 Use Case: Remove Guardian	14
3.3.6 Use Case: Add Doctor.....	15
3.3.7 Use Case: Remove Doctor	16
3.3.8 Use Case: Remove Patient.....	17
3.3.9 Use Case: View Body Temperature.....	18
3.3.10 Use Case: View Heart rate	19
3.3.11 Use Case: View Blood Pressure	20
3.3.12 Use Case: View / Edit Profile	21
3.3.13 Use Case: View Doctor / Patient / Guardian	22
3.4 Non-Functional Requirements.....	23
3.5 Resource Requirements.....	23
3.6 Project Feasibility	23
3.6.1 Technical Feasibility	23
3.6.2 Operational Feasibility	24
3.6.3 Legal & Ethical Feasibility.....	24
4 System Design.....	26
4.1 Design Approach.....	26
4.2 Design constraints	26
4.3 Design Interface	26
4.3.1 Low-Fidelity Prototype.....	26
4.3.2 High-Fidelity Prototype.....	33
4.4 Data Flow Diagram (DFD).....	38
4.5 Domain Model	39
4.6 State Transition Diagram	40
4.7 Entity-Relationship Diagram	41
4.8 Sequence Diagram	42
4.9 Class Diagram	44
4.10 Logical Data & Functional Flow.....	45
4.10.1 Functional Flow	45

5 SYSTEM IMPLEMENTATION.....	47
5.1 Strategy	47
5.2 Tools Used.....	47
5.3 Algorithms	47
5.4 Methodology	48
5.5 System Architecture.....	49
5.5.1 Data Layer	49
5.5.2 Processing Layer	49
5.5.3 Presentation Layer.....	49
6 Testing.....	51
6.1 Test Strategy.....	51
6.1.1 Component Testing.....	51
6.1.2 Unit Testing	51
6.1.3 Integration Testing.....	51
6.1.4 System Testing.....	51
6.2 Test Cases	52
7 CONCLUSION	70
7.1 Future Work.....	70
7.2 References.....	71