Dissertation Proposal

Augmentation, Analysis and Visualizations of Heart Pulse Rate using Pulse Sensor through Edge Analytics

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Company name : Oracle India Pvt Ltd.

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Title of the project: Augmentation, Analysis and Visualizations of Heart Pulse Rate using Pulse Sensor through Edge Analytics

Dissertation outline

Problem statement : Data gathering and augmentation of real-time heart pulse rate of a human volunteer from the pulse sensor connected to a near-by edge device, and to analyze the data collected to make prediction using Predictive Analytics Techniques to produce visualizations for decision making over a hand held device through an android application.

Objective of the project : This project is an attempt to converge the two ever developing fields of Internet of Things (IoT) and Data Analytics, in order to provide a complete solution for affordable health care to all through the state-of-the-art technologies.

Expected benefits to the organization: This project will be beneficial to my employer as it involves some of the emerging technologies in the IT industry today.

An employee with inherent knowledge of these latest technology is always an asset to the company.

Scope of work: Development of Data Gathering Module, Edge Analysis Module, Global thumbnail indexer Module, Android Hand held device module as well as Visualization module.

Resources needed (Hardware, Software): Raspberry pi, Heart pulse sensor, mobile device, python, Java, Raspbian OS and android.

Potential challenges / risks: H/w interfacing, Interoperability of the software solution as one complete solution

Supervisor

Supervisor	UmaShankar TM
Supervisor designation	Principal Member Technical Staff

Project milestones

#	Milestone	Target date
1	Literature Survey of Existing Technologies	16/06/2018
2	In-depth architectural design	30/06/2018
3	Pulse sensor configuration	07/07/2018
4	Data gathering and augmentation algorithm implementation.	21/07/2018
5	Thumbnail generation through predictive analysis on the edge device	04/08/2018
6	Storage Organization and retrieval of the predictive thumbnail data through the Global thumbnail indexer	18/08/2018
7	Orchestration of results through interactive and responsive graphs and tables.	01/09/2018
8	Integrations of all the modules.	08/09/2018
9	Deployment of the modules.	15/09/2018
10	Overall System testing of the modules.	29/09/2018

System Architecture

The architecture of the system is as depicted in the Figure 1. It has following components:

1)Data Gathering Module (Pulse Sensor)

2)Edge Analysis Module (Raspberry Pi)

3)Global thumbnail indexer Module (Cloud Storage)

4)Android Hand held device module & Visualization module (Mobile Application)

System Architecture

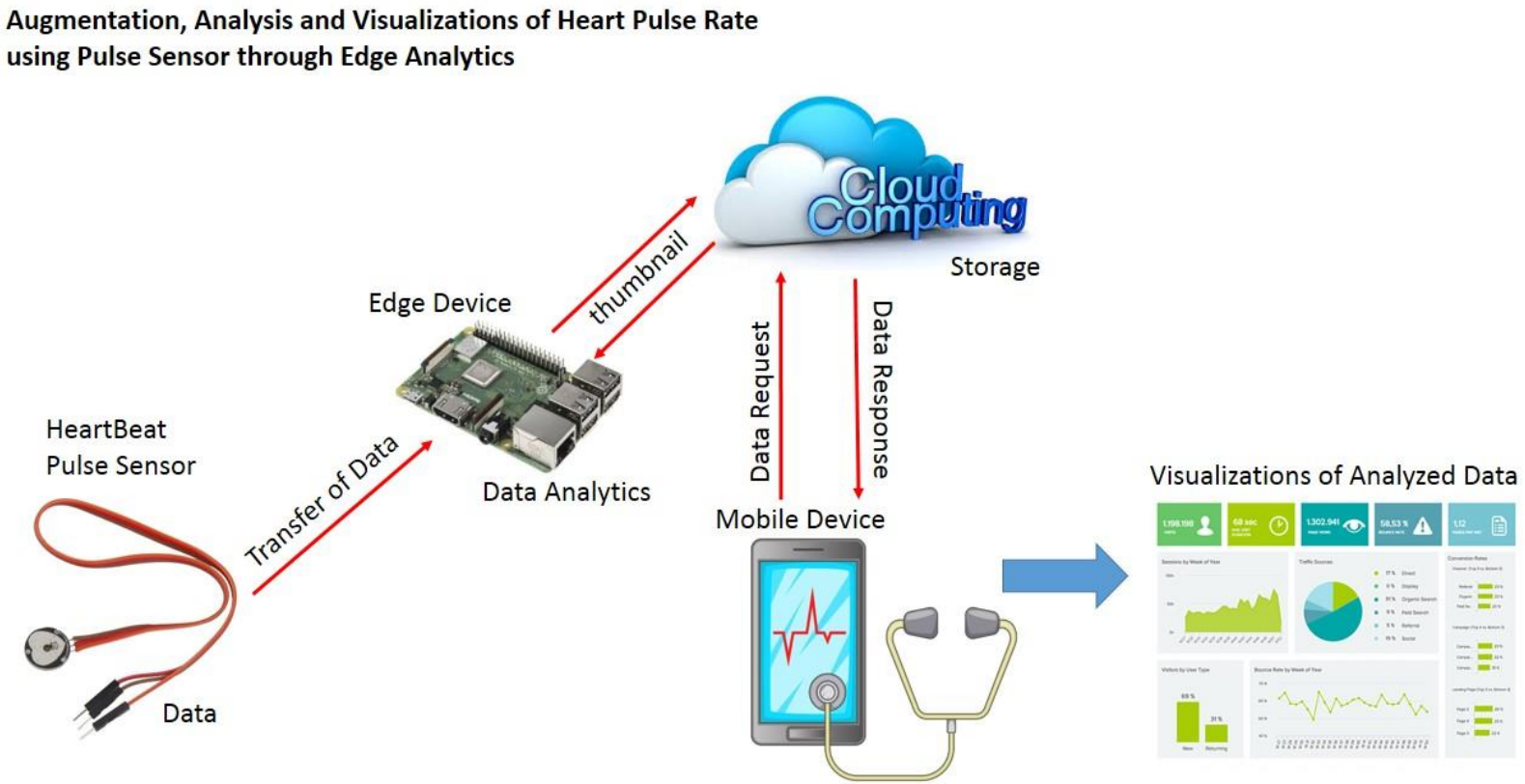
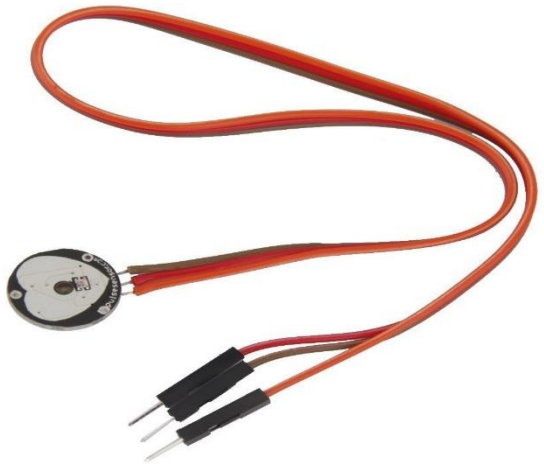


Figure 1: System Architecture

Data Gathering Module

This Module is responsible for the following operations:

- Data collection from human volunteer.
- Forwarding the data collected to nearby edge device.



Edge Analysis Module

This Module is responsible for the following operations:

- Data gathering and augmentation from pulse sensor.
- Analysis of the data to generate data thumbnails to be sent to cloud storage

Global thumbnail indexer Module

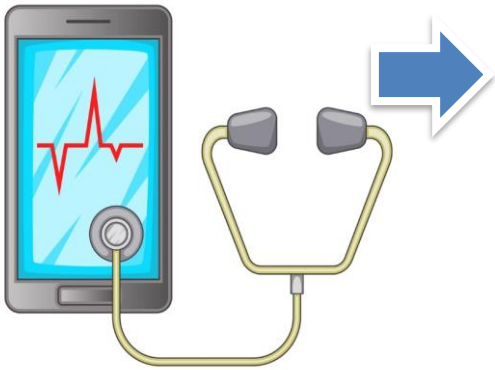
This Module is responsible for the following operations:

- Efficient storage, organization as well as retrieval of data.
- Storage and Retrieval of the historical data is from the cloud storage for the analysis and visualization.

Android Hand held device module & Visualization module

This Module is responsible for the following operations:

- An interactive android application interface.
- Various visualizations of the data collected for the individuals based on the samples collected from various demographics, age, period of time, etc.,



Thank you!