**Continuous Monitoring of Biological Fluids and Analysis.**

**Abstract:**

Evolution of bio - chemical sensors has made it possible to collect vital information from Biological Fluids such as Sweat, Saliva, Tears and Breath. While blood is by far the most understood sample for diagnostic measurements, these biological fluids are more readily accessible and thus are attractive targets for non/minimally-invasive wearable sensor platforms. Biological Fluids contain Glucose, Lactate. Concentration data of these compounds can be analysed and processed to diagnose fatalities in a Diabetic Patient/Athletes in real-time. These are seen as the pivotal steps towards prevention of unforeseen emergencies.

**Team Information:**

* Team member names/ Roles and Responsibilities:

**Sumit Deshmukh:** Research on sweat/skin surface monitoring with the help of bio sensors.

**Maansi Chandira:** Research on tears monitoring with the help of bio sensors.

**Leandra Menezes:** Research on saliva monitoring for diabetic patients with the help of bio sensors.

**Vipra Shah:** Research on relationship between glucose level and altitude, also narrow down the scope from 4 body fluids to 2.

* Key background and Expertise:

**Sumit Deshmukh:** 3.5 Years of experience in development of CT scan software building for Leading Medical Imaging Device Manufacturer.

**Maansi Chandira:** IT background, having experience working in Oracle Apps.

**Leandra Menezes:** Bachelors of Engineering in Information Technology and have a year experience in web development. Worked on projects like e-commerce recommendation algorithms and developing websites.

**Vipra Shah:** Bachelors of Engineering in Electronics and Communication engineering and having 3+ years of experience in software testing field in the healthcare domain.

**Project Objective:**

Objective is to alert Athletes or Diabetic Patients about abnormalities in Glucose and Lactate Concentration. Abnormalities in lactate level in athletes relates to his/her ability to cope up rigorous exercises. Abnormalities in Glucose level of diabetic patients leads to hyperglycemia or hypoglycemia.

**Project Scope:**

* Database will store the concentration data of Lactate and Glucose in real time.
* It will define normal and abnormal ranges of these concentrations for individuals categorized according to Age, Gender, Height, Weight and Body Temperature.
* Factors such as Room Temperature, Altitude and Humidity are considered as well in defining abnormality of concentrations in Lactate and Glucose.

**Project Deliverables:**

1. Project Report
2. Database System

**Assumptions and Constraints:**

List significant assumptions and constraints to the project

* Data from bio sensors is already available with us.
* Subject under consideration is either an athlete or a diabetic patient.
* Bio sensors are continuously monitoring the subject.
* Data for different environmental conditions is already with us.

**Integrated Master Schedule/Milestones:**

List key schedule tasks and major milestones

1. Define Actors, Entities, attributes and Relationships, Draw ER, EER diagram. Oct, 31 2015
2. Create Database with tables and Data. Nov , 14 2015
3. Write triggers and stored procedures to constantly analyze Data. Nov , 14 2015
4. Create Views for the actors involved. Define Views that activity bound (Before exercise/After exercise) (Before meal/After meal) Nov , 30 2015

**Reference:**

Advances in wearable chemical sensor design for monitoring biological fluids  
Authors: Giusy Matzeu, Larisa Florea ∗, Dermot Diamond

Tear glucose levels in normal people and in diabetic patients

Authors: D. K. SEN AND G. S. SARIN

<http://www.researchgate.net/publication/49686092_Relationship_between_Lactate_Concentrations_in_Active_Muscle_Sweat_and_Whole_Blood>

<http://www.sciencedirect.com/science/article/pii/S0956566313008257>

<http://pubs.rsc.org/en/Content/ArticleLanding/2013/AN/c3an01672b#!divAbstract>

<https://www.nlm.nih.gov/medlineplus/sweat.html>

<http://www.acs.org/content/acs/en/pressroom/presspacs/2013/acs-presspac-july-24-2013/first-human-tests-of-new-biosensor-that-warns-when-athletes-are-.html>

https://googleblog.blogspot.com/2014/01/introducing-our-smart-contact-lens.html

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1043796/?page=2

http://www.diabetes.co.uk/diabetes\_care/blood-sugar-level-ranges.html

http://europepmc.org/backend/ptpmcrender.fcgi?accid=PMC1043796&blobtype=pdf