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Bamboo Mobile Health

Fatigue & Stress Tracker

Introduction

Bamboo Mobile Health is a company focused on improving the quality of life of their patients. Keeping all information secure in compliance with HIPPA, Bamboo Mobile Health strives to provide mobile services that help patients access their information and predict trends.

Problem

Diseases such as Multiple Sclerosis have symptoms that vary in relation to humidity and temperature. These variations are hard to track and record with clear relations to humidity and temperature. If these variations can be monitored and tracked, health professionals can adapt treatment to improve the quality of life of the patient.

Bamboo Mobile Health is striving to allow patients to access their information remotely via internet enabled smart devices. This access is crucial for the patients to be able to input their fatigue level on the spot. With information and data on fatigue inputed in real time by the patient, trends could be easily mapped to a graph of weather variables. The patients can use this mobile access to see trends and relations between different weather aspects and their fatigue level. Health professionals could then use the data to see trends and adapt treatment to more individual and specific prescriptions.

Solution

Our solution involved creating a mobile web application that would pull weather data about the users current location while gathering data from the user on their fatigue level. It would then take that data and plot it on a graph. The user could then select which weather characteristics he or she would like to see a trend against. With this capability it would be trivial for a user to see how certain aspects of the weather and his or her current environment negatively or positively affected their fatigue level.

Design

First thing the user will see is a prompt for the user's username. The application uses this to access information about the user's health conditions over time from a database. If the application cannot access the devices location, the user will also see a prompt for zip code below the username field.

Once it has the information about the user and his or her location, it pulls weather history information and passes this to a graph that has the ability to show only one or multiple weather trends against the user's information. This relatively simple design allows for a easy interface to appeal to less tech savvy users.

Technology

HTML5:	To gather device location and properly scale the webpage any device
Javascript:	To parse Weather API and data from temporary csv file
CSS:	To present the application in a beautiful way.
D3:	To help with data visualization.
Json:	Contains the datas on weather trends by date per hour

Implementation Details

Multiple weather history APIs were investigated including National Weather Service, Weather Underground(Wunderground) , and WeatherSource. Wunderground was selected based on ease of use and functionality. A free Wunderground API account was created to receive a limited (10 calls/minute, 500 calls/day) API key required for calls to the server. Ajax is used to first connect to Wunderground to retrieve city and state from either the provided zip code or gps coordinates. Once the city and state are obtained, multiple API calls for the last few days are triggered to receive the minimum and maximum temperature for those particular days with a formatted date string for potential display use. The temperature and dates are then stored in JavaScript arrays and referenced for data visualization using the JavaScript D3 library for scatter and line plots. Patient health statistics such as stress and fatigue are read from a comma separated file and plotted with the weather data and displayed as the user selects.

Elevator Pitch

Multiple sclerosis (MS) is a potentially debilitating disease in which your body's immune system eats away at the protective sheath that covers your nerves. The pain multiple sclerosis patients combat vary on a daily based upon the temperature and even the barometric pressure. This web application will allow Bamboo Mobile Health patients to manage the severity of stress and fatigue with the touch of a button.