International Journal of Scientific Research in Computer Science, Engineering and Information Technology
 | Volume 3 | Issue 3 | ISSN : 2456-3307

Daily Mood Assessment Based on Mobile Phone Sensing

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ABSTRACT

The increasing of stress and unhealthy lifestyle in peoples daily life, mental healths problems are now becoming a global concern. In particular, the mood related mental health problems such as mood disorders, depressions and elation are seriously impacting peoples quality of life. However due to the complexity and unstableness of personal mood, assessing and analyzing daily mood is both difficult and inconvenient. Which is a major challenge in mental health care.In this paper we propose a novel framework called MoodStats for assessing and analyzing mood in daily life.

Keywords: Mobile Phone Sensor, Mood Assessment, Behavior Modeling, Mobile Healthcare.

I. INTRODUCTION

In the last decade, the mobile phone has taken on greater emotional and practical significance in peoples lives. They help one navigate not only places and purchases, but also social identities and psychological transitions.Research also suggests that smartphone ownership is not restricted by socioeconomic status. Thus, they represent a widely available and highly accessible medium for capturing data about diverse populations.Mobile phones also have value as being potentially very cost-effective data collection tools, as they are highly scalable.Serious mental illnesses are among the most pressing public healthcare concerns.Continuous and unobtrusive sensing of social and physical functioning has tremendous potential to support lifelong health management by acting as an early warning system to detect changes in mental well-being, delivering context-aware microinterventions to patients when and where they need them and significantly accelerating patient understanding of their illness.In the field of affective sciences a distinction is often made between emotions and moods. Whereas emotions are short and intense reactions to specific events, moods rarely have a specific object, are longer in duration and are often less intense.Our application, MoodStats focuses on sensing and monitoring mood dimensions just using embedded phone sensors.Our app uses mobile phone data, Mobile phone sensor data and communication data (including acceleration, light, ambient sound, location, calllog etc) to extract human behaviour pattern and assess daily mood. Our approach will overcome the problem of subjectivity and inconsistency of traditional mood assessment methods and achieve a good accuracy with minimal user intervention. We will built a system with clients on android platform and an assessment model based on factor graph. MoodStats will provide an opportunity to collect and deliver individualized mood information to improve self-management and health behavior change over time.

II. LITERATURE SURVEY

We will be developing a web application which helpto people and it is used to assess mood state in daily life.It gives us flexibility to find a relationship between daily behavior and particular mood dimension, which is often more remarkable.

III. PROPOSED SYSTEM

Our system, called MoodStats, focuses on daily mood assessment based on mobile phone sensors and communication events. The proposed system contains a client application based on Android platform, and a back-end server built in Java.The client application collects sensor data as well as communication logs, applies simple analysis on the data, and finally transfers the data to the server. The back-end server stores data from all users and creates personalized model that outputs daily mood based on collected data. The output mood is then fed back to the user with a configured regular period.We next present in detail the implementation of our system. We only cover Android platform for now, but since sensor availability does not differ much on different mobile platforms, our approach can be easily adapted for other platforms

• **Android platform Sensor**

Android is a Linux based operating system in mobile devices such as smartphones and tablet computers. Android contains a kernel based on the Linux kernel, and a mobile optimized virtual machine called Dalvik. Applications on Android are Java based and translated to Dalvik dex-code which runs on Dalvik. Starting from 2007, Android is becoming popular mobile operation system .Android has the ability in supporting a wide range of sensors.Currently, the Android API of version 16 describes 11 sensor types4, contains new sensor types adding gradually.Android phones all have sound sensor—microphone, and most of them locates using GPS, WIFI, etc.. But, since Android is used largely in variety of devices, and different devices can run different versions of Android system, their is no guarantee of the availability of a particular sensor type on a particular device. Selection of several sensor types based on the daily use, behavior modeling and availability on different devices. Android uses broadcaster-receiver pattern that manages sensors .When an application wants to use a sensor, it first registers itself as a receiver to the system, and at the same time, it specifies a sensitivity level at which it wants to receive sensor data. Then an event is sent to the applicationwhen sensor value is changed (according to the sensitivity level)[9]

• **Accelerometer**. The accelerometer data can be calculated by measuring applied forces to the sensor itself, which include the force of gravity. There are three major readings corresponding to three axes of Android coordinate system: the x-axis horizontal (right), the y-axis vertical (up), and the z- axis points towards the outside of the front face of the screen [9].

• **Sound sensor**

Actually, sound sensor is not an Android sensor type. Every phone has an inbuilt microphone, which is used to sense background sound and user's voice. Environmental sound affects human mood and human voice exhibits mood states of the speaker.

• **Location.**

Location relates to mood, and can also provide context information for user behavior. Android platform provides coarse as well as fine location services. Location can be find out by both GPS, WIFI,or cellular network. Fine location given by GPS can achieve accurate better than 3 meters; the location error without GPS may be of tens of meters, but usually acceptable for building-level localizing.

• **Light sensor.**

Ambient light sensor is mainly used in mobile phone to auto-adjust the screen brightness, controls keypad backlight, etc..Optical track pad on some phones uses light sensor. In daily mood assessment, ambient light can be installed to discover the position of the phone—in bag, in pocket, or on desk and to detect environment brightness.

IV. FURTHER SCOPE

Along with the mobile phones evolution, mobile phone sensing has also gained publicity due to its convenience. Mobile sensing applications can help in building novel persuasive systems in future that are still largely unknown .Our app, MoodStats will provide an opportunity to collect and deliver individualized mood information and will mediate to improve self-management and health behavior change timely. We will progress to collect larger datasets and add both sensor and label data. Our attempt to work on understanding not static but dynamic affect using long-term data. Our solutions is much generic that is useful in understanding factors that influence any identifiable affective changes. With the help of rich data retrived from real life, and the ability to identify patterns reliably relating it to affective state, people will be able to investigate soon to not only measure, but for better improvement of affective conditions.

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