

Swipe Count Alerter to Prevent ‘Smartphone Thumb’



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Abstract : Smartphones are the devices that can do more than just calling now-a-days. With the rise in large numbers of mobile applications, the time people spend interacting with their phones has also increased. The Repetitive strain in fingers due to continuous usage of touch screens causes swelling and severe pain in fingers. To prevent this issue we develop a mobile application to notify the user with the swipe counts made. The user thus, has to control the usage of smartphones. The Counts are compared with a threshold limit to check if it has reached the limit. If the number of swipes is found to reach a limit an alert notification is sent to the user stating that they have made this number of swipes. This provides an hourly notification of the number of swipes made. This mobile application also checks the data of the number of swipes made each day and provides an average of all. This helps the user to get an idea of the number of swipes they make each day and this should try to control their continuous usage of fingers for tapping, texting and swiping. This also helps the user to prevent tendon weakness and severe issues like inability to bend the thumb.

Keywords: Tendon, Thumb, Touch Screen, Smart Phone, Text Claw, Cell phone elbow, Specific Absorption Rate.

I. INTRODUCTION

Touch Screen is an invention which helps people more easily interact with mobile phones. Touch based applications such as video games, chatting are more frequently used which in turn gives an alarming increase in “Smartphone thumb”. Users give input or control the information processing system through simple or multi-touch gestures by touching the screen of the smartphone with one or more fingers or with a special stylus. The pain that comes from the repetitive movements of texting have been dubbed as “Smartphone thumb”. The formal name for smartphone thumb is Tendonitis – an inflammation or irritation of a tendon, a thick cord that attaches bone to muscle. Researchers think that it is caused by the thumb force required when texting.

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The emitted radiation in mobile phones is This abnormal bone movement of the thumb could be causing pain and eventual arthritis. Too much texting leads to more cases of arthritis in the thumb. electromagnetic ray in the microwave range (850–1800) which indicates that the frequency produced by mobile phones or base stations may affect the health of the people [6]. So, In order to overcome this problem, we decided to develop a mobile application which will help out as much as possible.

II. LITERATURE SURVEY

Many research papers which are related to the detection of swipes and their impact on thumb and other ill effects on health have been referred. There are a lot of health issues rising due to continuous usage of smartphones [1]. Smartphones affect mostly all parts of our body including the brain. Texter’s thumb or Blackberry thumb is raised as a result of continuous usage of thumbs for texting, playing games etc. Touch dynamics is the most common method used for continuous authentication of mobile phones [2]. In Touch dynamics, the touchscreen input is used as the input data source to carry out the further processes. The information gathered during touch dynamics were x and y coordinates of each swipe, velocity of the swipe and the count of the swipes made. The Swipe dynamics [3] includes features such as, recording the sequence of data related to the swipe operation. These operations include time, positions, and velocity. This categorizes the swipe based on the orientation of the swipe, velocity of swipe, distance between the two end points in each swipe. The exposure of the general population to radiofrequency fields from mobile phones has become common and continuous in recent years. The possibility that some people experience is hypersensitivity or other symptoms in response to mobile exposure was a high priority. The skin receives much radiation when it is in contact with mobile phone although many studies have been carried out on the effect of electromagnetic radiation on biologic system and intracranial tumors, Diseases of the skin, especially skin cancers and contact dermatitis, are very important because of their high prevalence, chronic nature of the disease, and high impact on the quality of life (skin diseases cause pain and discomfort in 21% to 87% of the affected people). Skin diseases allocated a high burden of disease in all age groups [6].

III. PROPOSED SYSTEM

Though Smartphones have made our lives easier, many people have complained of finger, hand and elbow pain as a result of using their device.

In non-medical terms, these conditions have been referred to as “Text claw” and “Cell Phone elbow”.It describes all of the finger cramping and aching muscles that come from constant gaming, scrolling and texting on smartphones.

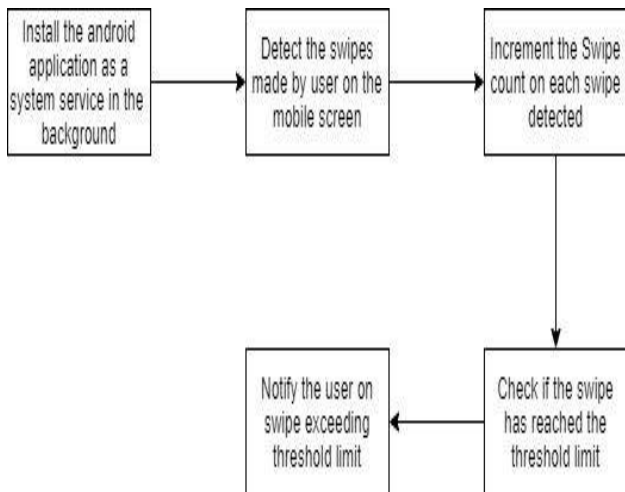


Fig 3.1: Overall workflow

3.1. Swipe Detection

To identify the effect of touch,swipes and taps, user touch events on the screen are monitored continuously. This is done by implementing a background service android application that runs all the time monitoring the Swipe event in the touch screen. This requires that application service to be started On mobile Boot and uses the permission “RECEIVE_BOOT_COMPLETED” and the “SYSTEM_ALERT”. The autostart class uses the onReceive method to detect the start of the service. A new onTouchEvent() is triggered with an ACTION_MOVE event. Whenever the current touch contact position, pressure, or size changes.All of these events are recorded in the MotionEvent parameter of the onTouchEvent().

There are many different ways to track movements, depending on the needs of your application. For example:

- The starting and the ending position of a pointer (for example, move an on-screen object from point A to point B).
- The direction the pointer in which it is traveling in, is determined by the x and y coordinates.

The velocity of the pointer in which way it moves across the touch screen.

3.2 Swipe counter:

When a swipe input is detected this application increases the count of the swipes made. The swipe is detected by sensing the MotionEvent. The threshold value of the number of swipes is set. If the number of counts reached the maximum threshold limit, the user will get a notification to avoid overuse of the touch feature on the phone. For this user must have the application installed and give access rights required to it.The application is designed in such a way that each time when the user swipes or texts or taps the count gets incremented.

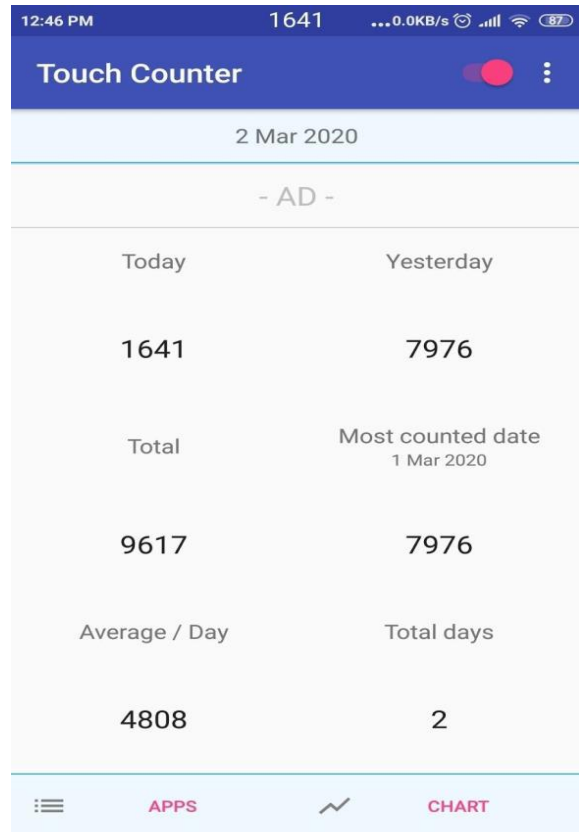


Fig 3.2: Display the swipes made per day, the before day, total and their average

3.3 Intensity of Radiation:

This application is also concerned about the radiation effects on the hand tissue due to continuous swiping or tapping of touch screens for a long time. Similarly the intensity of this Specific absorption rate is high when the mobile data is ON. So this application is designed to check if the mobile data is ON and thus alerts the user of this issue. The intensity of the radiation will be high when the internet connection is used. When this is detected the alert message is sent to the user to notify that the intensity of radiation is high.

Each day the count is set to zero initially and increases based on the swipes and taps made by the user. This class uses the calendar permissions to restart the application each day. If the count reaches the threshold, then the user will get notified. This will happen every hour. This way the application is designed.

3.4 Display statistics:

The swipes, touches, and taps detected for each app running and this data is used to find the time the user is spending in each app. This statistics and the average swipes made each week is displayed to the user. This application provides the user’s average touch screen usage of a period of 7 days. This may help the user with the statistics about the mobile usage as well as the radiation rate they are exposed to.

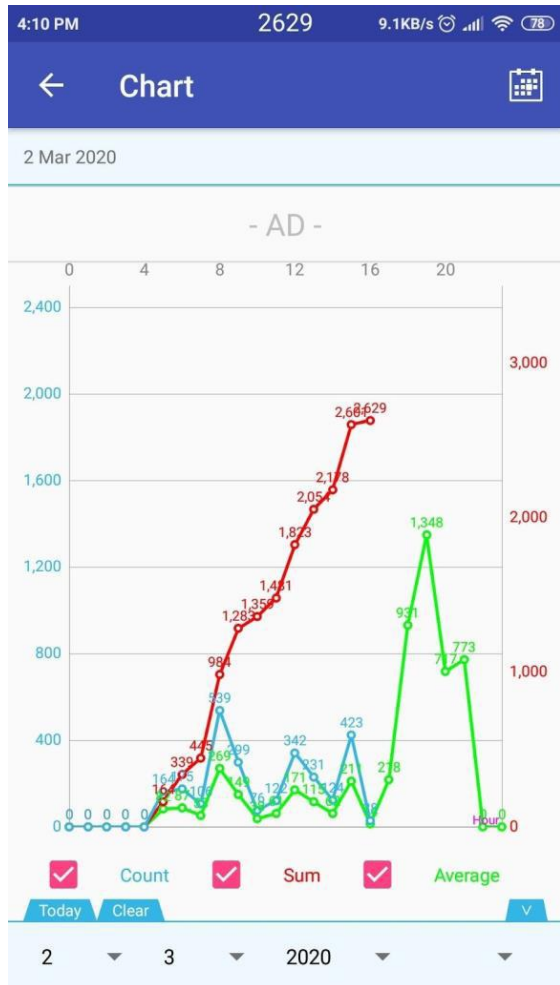


Fig 3.3: Graph showing the swipe analysis

IV. RESULT EVALUATION

The main aim of this research is to present the user with statistics of the swipes made. Taking multiple users into account we can see the average swipes made per day.

Table 4.1: Various User Analysis

USERS	TOTAL SWIPES MADE PER DAY	SWIPE COUNT PER WEEK	AVERAGE SWIPES PER WEEK
User-1	6,459	42,360	6,051
User-2	5,329	38,256	5,465
User-3	5,946	43,630	6,232
User-4	4,357	27,538	3,934

V. CONCLUSION AND FUTURE SCOPE

This mobile application based guidance to prevent Smartphone thumb can prove to be a helpful system. We can know how much we are using mobile phones and thus can reduce using mobile. This application helps users to get notified about the number of swipes they are doing on an hourly basis. This mobile application serves as a reliable and efficient solution for all mobile users. This work can be developed further to detect the high intensity of radiation and effects on the thumb as well as other parts of hands such

as wrist elbows etc. It can also be traced to provide an alternative method rather than swiping the mobile phone after the threshold limit of swiping has been reached. These alternatives can be voice detection , tilting of the mobile phone, using mobile at some distance from the direct exposure to fingers.

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