Acceleration Detector for Phone Safety

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Abstract:- As the era of technology is increasing daily more and more people are using mobile phones, tablets, laptops. This idea of acceleration detector can keep an person device cozy from circuit harm, catching fire and scratches at the display screen. The concept of acceleration detector is that, when there may be a loose falling movement takes place then a bag will pop up from the cover of the phone. In this process we will save you all the statistics present in the telephone or laptop by now not losing the gadget. We save plenty of cash through saving the device from harm. The use of cell phone being the necessity for every person now its protection is likewise that essential to us now. So we need an innovation to defend it in case of fall such that it does no longer ruin and the statistics as well as its bodily condition remains intact. So we have give you the device called acceleration detector for smart phone, the feature would be each time the telephone falls the clips are pumped out in this kind of manner that telephone could no longer hit the floor . As we recognize that once a phone falls down it goes in a free fall movement and acceleration reaches extra than positive restriction so we are going to use that fact and put into effect our concept to deliver a useful product.

Keywords:- *Gadgets, Safety, Acceleration, Free-Fall, Protection.*

I. INTRODUCTION

There is big boom inside the utilization of mobile phone and laptops nowadays. These gadgets have turn out to be a part of our lifestyles, we use them in our day nowadays lifestyles for talking to others, gaining understanding and exposing to the sector, taking pix and lots of greater thinks. It is very tough folks to live without a phone. As the call for the smart telephones has expanded the charge of it is also growing exponentially. With the accelerated in range of smart phones the upkeep also exceeding, the value of harm and lack of smart telephones comes to billions of greenbacks in line with 12 months. The possible disaster that occurs is that from time to time we'd drop smart phone or laptop. It may lead to damage of internal circuit or on occasion a dropped gadget may result in hearth primarily based on their circumstances. While cellular phones have definitely disregarded the idea of the uninteresting form element, one factor that has not been focused or tackled nicely even after such a lot of years is how a lot the smart phones are liable to unintentional drops. The smart gadgets take a moment to bring all the funding down to zero, extra with the intention to negative in case you get a substitute. To keep away from lack of gadgets and cash we got here with an idea of defensive the system even as it's far dropping. That is an acceleration detector for phone, it opens while a machine is in a free fall movement.

II. LITERATURE REVIEW

A. National Status

As far as the Indian market is concerned no such research and development has been brought into attention from anywhere inside the country, regarding the current subject of smart phone fall protection and acceleration detection system. As of now, thick smart phone cases and screen guards are the only things protecting our smart phones from any damage.

B. International Status

In the International Market, as of yet, only a German student has come up with a similar idea of developing an 'airbag-like' protection system for smart phones. This system comes into operation whenever the system detects if the phone is exceeding a fixed acceleration as detected by sensors attached to the smart phone cover, prompting it to let out structures which will slow down the speed of the fall. No other research and development has been done for the similar subject anywhere else.

C. Importance of the Proposed Project in the Context of the Current Status

With a country as populated as India, there is much hustle-bustle on a regular basis. Moving and travelling are essential aspects of every individual's life, be it travelling to work via public transports or running from one classroom to another or running down a flight of stairs. Doing all these, there is a constant fear in our minds, 'My smart phone should not fall to the ground and break.' Calling this fear vain, would be an understatement as a lot of investment, both financial as well as emotional, goes into buying a smart phone and using it. With no such products researched upon, we would like to propose our 'Smartphone fall protection and acceleration detection system'. Lightweight plastics will be used in the making of such system along with some sensors and the protecting unit. These all might add to the initial investment in the phone but it would be one time investment and the other limitation that the product might face is the seemingly bulky nature of the phone case. But again, if keep aside the bulky but not so heavy nature of the case, this product could be a big success in the Indian market where the mobile phone users are already in a frenzy to buy every other accessory for their smart phones.

This system would be used for the much-needed task of protecting our smart phones, when they accidentally fall out of our pockets or slip from our hands. In future, this model can also be deployed for PDAs and other hand-held devices like tabs, which all require a huge monetary expense each time any damage happens.

In 'Optimization of an Accelerometer and Gyroscope-Based FallDetection Algorithm' (2014) by Quoc T. Huynh, Uyen D. Nguyen,Lucia B. Irazabal,[1]an optimized fall detection algorithm was developed using acceleration and angular velocity data collected from a wireless sensor system located in the center chest. Using an optimization approach, critical thresholds are determined through this work that results in robust fall detection. The system proposed herein is for a dedicated, wearable fall detection sensor system. Integration and deployment of the algorithm onto a smartphone, smartwatch device, or other mobile communication systems would be beneficial not only in detection of a fall, but also in alerting caregivers and other providers to the fall event.

III. METHODOLOGY

The project 'Accelerator Detector for phone safety' is proposed to ensure the safety of our mobile phones or any other electronic devices upon freefall. It is mainly used to solve the problem of phones being broken immediately upon freefall. Phones have become the necessity for everyone in today's world, and thus, its safety is also that important to us. So, we need an innovative concept to protect it in case of freefall so that it does not break and the stored data as well as its physical condition remains intact. So, we have come up with the device called acceleration detector for phone safety. Whenever the phone falls, the clips are pumped out in such a way that the phone would not hit the ground. As we know, that when a phone falls down, it goes in a free fall motion and the acceleration reaches more than a certain limit, like 9.8, so we are going to use that fact and implement our idea to deliver a useful product.

The acceleration detector in the system is used for measuring the acceleration in the surroundings of our device. This detector will be able to detect the acceleration during the fall and if the acceleration is greater than 9.8 or approximately equal to 10, a case of free-fall occurs and the safety sockets or clips are pushed out due to the battery being overcharged. The supports will come out from the device before the device hits the floor and hence, save our devices from breaking into pieces. The devices can have such supports attached to them which will open automatically during the time of free-fall or any situations of falling. A systematic evaluation of the fall can be made which is very essential to assess the applicability of our proposed system in real-time daily life situations. Therefore, the acceleration needs to be checked at the time of fall and if it is less than the acceleration due to gravity, the device is safe, but if it is greater than 9.8, then the device might be in the state of danger. In such cases, the supports attached to the device will pop out automatically and save the device from hitting the floor.

The Acceleration detection system we have proposed has the following components: Arduino, accelerometer, buzzer, servo motor, any phone cover and a breadboard. The phone case of the dummy mobile handset has an accelerometer and a servo motor attached to it. The accelerometer and the servo motor are furthermore connected to the Arduino via the breadboard. Also, a buzzer is attached to the Arduino for alarming the user whenever the handset is about to touch the ground or is in a free fall motion.

The working of the invention can be understood as when suddenly or unknowingly the owner drops the phone or the phone falls off his/her hand then this proposed system of ours works in a way such that the accelerometer detects the acceleration of motion of the handset and signals the servo motor to rotate and the buzzer to sound an alarm. In response to the signal, the servo motor rotates by a certain vertical way and the buzzer starts the alarm, notifying the owner of the impending damage that may be caused to our handset.

IV. CONCLUSION

➢ We have developed a prototype of an acceleration detection system, which aims to reduce the impact of fall on the mobile phones whenever they tend to fall to ground.
➢ Upon analysing the prototype, we could gather the information from the working examples that the clip structure popped out whenever it was detected that the mobile phone was in a free fall motion.
➢ Thus, upon reaching the ground, the impact of free fall was taken up by the clips rather than the mobile phone having to face any damages, which would have been costlier to get repaired then utilizing this system for our mobile phones.
➢ The entire cost in making our prototype is lesser than what goes into getting the handsets repaired.
➢ Consumers would definitely be attracted by our proposed product, since everybody wants to cut off unnecessary expenditure along with saving the data that their handsets store.

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