GPS Place Reminder with Pattern Searching and Accident Detection

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Abstract: GPS place remainder and Accident Detection system is used to remind the user about a particular product and to detect accident occurrence. The GPS place remainder system is used to notify the user when a location reaches with product availability. For this the system make use of fastest searching algorithm called Boyer-Moore Algorithm. This system also got the feature of accident detection. When an accident occurs, the user's phone automatically detects the accident and notify the nearest hospital and friends. Both this feature is developed in the android application for better user interface.

Keywords: Boyer Moore Algorithm, Bad character rule, Good suffix rule, Wi-Fi.

1. Introduction

There is a lot of update and ready framework in the present cell phones. In any case, all these update framework work dependent on time and date. Now and again there is a craving for updates dependent on area or location. For a model in the day by day schedule, we go to the shopping center to buy recorded things n, the greater part of the things n, a large portion of the occasions we overlook a portion of the thing to be obtained. We need ourselves to be helped to remember the things next time we are at the shopping center. Each we utilize unique messages so as to help us the future undertakings.

These messages, known as updates, take numerous structures, for example, post-it notes, messaging oneself, daily agendas, and electronic chemical alarms. For instance, an understudy may send himself an email to remind himself to bring a book for class the following day. So proposed application Place Reminder, Location Based Reminder on cell phones enable the client to set updates dependent on the area in the cell phones. The rest of set to state for market each time when we go to the supermarket the rest of being shown on our mobiles

It is wanted that there would be an update framework or application to consequently remind individuals what they may have neglected to bring along exactly when the progression at that specific area. The present application is persuaded by these circumstances. In this way, our proposed application Place Reminder Location Based Reminder illuminates every single such circumstance by giving the message at whatever point a client achieves area.

Accident prevention may be hard but if that accident can get immediate attention then we can at least save a life. So the system makes this possible in a cost-efficient way. All we need for this is Wi-Fi, mobile data, and our application. So whenever an accident occurs the application detects this and notify the nearest hospital and friends by a phone call, text message and sharing victim's location.

Wi-Fi plays an important role in an accident detection system. Wi-Fi is the name of a well-known remote systems administration innovation that utilizes radio waves to give remote rapid Internet and system associations. Wi-Fi systems have no physical wired association among sender and recipient by utilizing radio recurrence (RF) innovation, a recurrence inside the electromagnetic range related to radio wave spread. At the point when an RF current is provided to a reception apparatus, an electromagnetic field is made that at that point can spread through space.

GPS (Global Positioning System) is a key idea in Place Reminder and accident detection. The GPS is a location-based satellite route framework that gives area and time data in every single climate condition, any place on or close to the Earth where there is a non-impeded observable pathway to at least four GPS satellites. We need a GPS beneficiary empowered Android Mobile Phone for getting the GPS information from the satellite. There is a wide scope of such mobiles are accessible in the market.

Pattern Searching is a significant issue in software engineering. The most efficient Pattern Searching algorithm is the Boyer Moore Algorithm. The algorithm of Boyer Moore contrasts the pattern and the content right to left. If the compared text in the rightmost pattern symbol does not occur in the pattern at all, then the pattern can be shifted by m positions behind the text symbol. The best case for the Boyer-Moore algorithm is accomplished if at each try the first thought about content image does not happen in the pattern. At that point, the algorithm requires just O(n/m) correlations.

2. Literature review

Location Based Services: M. Indumathy et al. [1], Location data is significant in many figuring applications. Location Based Service [3] is an administration that helps in giving a geological circumstance. By utilizing services it is simple for the clients. It looks and find different people, vehicles, assets and to give location touchy services, likewise to follow their

International Journal of Research in Engineering, Science and Management
Volume-3, Issue-2, February-2020
www.ijresm.com | ISSN (Online): 2581-5792

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very own location. The rising intermingling and joining of advanced correspondence innovation dependent on portable systems, driven by the accomplishment of Internet innovation, are currently centered around offer services that are connected by the location of people. The solicitation for the area can control in the cell phone or in another information like application supplier or system administrator. These services speak to another test, both hypothetical and in fact. Giving clients to add esteems to unimportant location data is a troublesome undertaking. Individuals dependably keep their cell phones, workstations with them.

Android stage [4] is another generation of smart cell phone platform propelled by Google. Android gives the help of portable guide and location service, which is most likely to worry about the number of engineers. Up until this point, the improvement of the portable guide and location applications is unpredictable and troublesome. Android is free and open, giving a simple to-utilize advancement pack containing adaptable guide show and control capacities.

Boyer-Moore Algorithm: Robbi Rahim et al Boyer-Moore algorithm [2] distributed in 1977 and around then is considered as the most proficient string coordinating algorithm. It performed character examinations in switch request from ideal to one side of the pattern and did not require the entire pattern to be looked if there should be an occurrence of a confound. If there should arise an occurrence of a match or bungle, it utilized two moving guidelines to move the pattern right. The reality multifaceted nature of the pre-processing stage is $O(m+|\Sigma|)$ and the most pessimistic scenario running time of the looking stage is $O(nm +|\Sigma|)$. The best instance of the Boyer-Moore algorithm is $O(n/m)$.

Knuth-Morris-Pratt: Nimisha Singla, Deepak Garget al.this Knuth-Morris-Pratt (KMP) algorithm[5] is proposed in 1977 to accelerate the strategy of definite example coordinating by improving the lengths of the movements. It thinks about the characters from left to right of the example. If there should be an occurrence of match or bungle, it utilizes the past learning of correlations with register the following position of the pattern with the content.

Quick Search (QS) Algorithm: Nimisha Singla, Deepak Garg et al. Quick Search (QS) algorithm[5] perform examinations from left to correct request, it's moving criteria is by seeing one character appropriate to the pattern and by applying terrible character moving principle. Boyer-Moore Smith saw that by processing the BMH move, in some cases boost the movements than QS shifts. It utilizes the terrible character moving guideline of BMH and QS awful character principle to move the pattern.

3. Objective of the project

In this project, there are 2 modules. One is placed remainder and other is Accident detection. In place remainder module when the user searches for an item, using the fastest algorithm Boyer Moore algorithm find the matching results and show to the user and he can select the items he wants and it will be saved

in the database. Then when the location with the item available shop is near it notify the user through our application. Then he can either view the location or he can call the shop.

Next module is accident detection [6]. User's car must have an inbuilt Wi-Fi adapter. Whenever an accident occurs Wi-Fi get started and it automatically pairs with the user's phone since it is once paired. So when this Wi-Fi is connected with the phone it will automatically send the data to the nearest hospital and notify them. Our application only gets invoked when that particular Wi-Fi is paired with our phone.

4. Methodology

In the place remainder module, the most important part is the searching algorithm, we use the Pattern Searching algorithm to look through the items. The Boyer-Moore algorithm [5] incorporates the most effective string coordinating algorithm contrasted with other string coordinating algorithms because of the productive idea of the calculation, many string coordinating algorithms created dependent on the idea of Boyer-Moore Algorithm, some of which are the Turbo BM Algorithm and Quick Search Algorithm, concerning the string seek steps on the Boyer-Moore calculation as follows:

1. When we hit a mismatch, move P along until the mismatch turns into a match ["Bad character rule"].
2. When we move P along, ensure characters that coordinated in the last arrangement likewise coordinate in the following arrangement ["Good Suffix rule"].
3. Try arrangements in a single heading, yet do character correlations the other way [For longer skips].

Boyer Moore Algorithm has two heuristics. Every heuristic is put into play when a mismatch happens. They give us the most extreme number of characters the hunting example can push ahead securely and still realize that there are no characters that should be checked. Boyer Moore calculation utilizes two heuristics: Bad Character Rule and Good Suffix Rule.

1. *Bad Character Rule:* When the comparison gives a mismatch, the bad character heuristic proposes moving the pattern to the right side by a sum with the goal that the bad character from the string will coordinate the furthest right event of the bad character in the pattern. If the bad character doesn't happen in the pattern, at that point the pattern might be moved totally past the bad character. If the furthest right event of the bad character is to the right side of the present bad character position, at that point this heuristic makes no proposition.
2. *Good Suffix Rule:* The good-suffix heuristic proposes to move the pattern to the right side by the least sum so a gathering of characters in the pattern will coordinate with the good suffix found in the text. Let t = substring coordinated by inner loop; skip until (a) there are no jumbles among P and tor (b) P moves past.

International Journal of Research in Engineering, Science and Management
Volume-3, Issue-2, February-2020
www.ijresm.com | ISSN (Online): 2581-5792

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5. Implementation

In the accident detection module Wi-Fi is the key element. Each Wi-Fi has got a unique BSSID. So when our phone is connected to the Wi-Fi with our application checks BSSID. So when it matches with our BSSID the Wi-Fi gets disconnected and automatically ON the mobile data. Then the application waits for 10 seconds for the user to cancel the sending data to the hospital. So if the user doesn't cancel the application in 10 seconds the phone checks for the nearest hospital and relatives and notify them by calling, sending a Text message and sharing the victim's location.
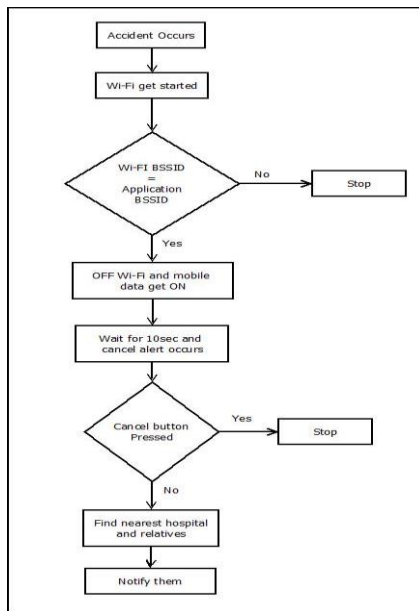
Algorithm: Pattern Searching [7]
Input: Pattern with m characters and Text with n characters.
Output: Index of the first substring of t matching p.

1. $a \leftarrow m$
2. $i \leftarrow m-1$
3. until $(i < n)$ loop
   3.1 $a \leftarrow m$
   3.2 $f \leftarrow 0$
   3.3 $j \leftarrow m-1$
   3.4 until $(j >= 0)$ loop
      3.4.1   If $(t[i] = p[j])$ then
      $i \leftarrow I - 1$
      3.4.2   Else
      $f \leftarrow 1$
      $jj \leftarrow 0$
      $ii \leftarrow j-1$
      until $(ii >= 0)$ loop
      $jj \leftarrow jj + 1$
      if $t[i] = p[ii]$

$a \leftarrow jj$
exit loop
$ii \leftarrow ii-1$
3.5 exit loop
3.6 $j \leftarrow j-1$
3.7 if $(f = 0)$ then
   3.7.1   return 1 // pattern matched
   3.7.2 $i \leftarrow i + a$

A. Comparative analysis

Algorithm	Preprocess Phase	Searching Phase	Extra space	Comparison order
Boyer-Moore	$O(m+|\Sigma|)$	$O(mn)$	$O(m+|\Sigma|)$	Right to Left
Quick Search	$O(m+|\Sigma|)$	$O(mn)$	$O(|\Sigma|)$	First right then left to right
Knuth-Morris-Pratt	$O(m)$	$O(n)$	$O(m)$	Left to Right

Boyer-Moore Algorithm is incredibly quick on the larger letter set (with respect to the length of the pattern).

6. Conclusion

A location based reminder application on android stage was effectively created which can spare at least one update at once. It has been tried by sparing locations at various areas and it gave legitimate yield at the correct spot. The Boyer-Moore Algorithm is a generally excellent and proficient string searching or pattern searching algorithm. Its best case running time is sub-direct and most pessimistic scenario running time is straight.

Accident detection systems are also very helpful in today's world. There are other accident detection techniques also but they are very expensive to implement. But our system requires less hardware and inexpensive and the setup is simple. Both this module is controlled by a simple user-friendly application. Since in today's world, everything is with the application, this application may come very handy.

7. Future scope

The focus of future work is to improve the existing algorithm and finding the proficient string searching algorithm with the goal that looking pace can be expanded and execution also.

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International Journal of Research in Engineering, Science and Management
Volume-3, Issue-2, February-2020
www.ijresm.com | ISSN (Online): 2581-5792

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