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Location Search Engine for Smartphones

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ABSTRACT: Smartphones have become very popular. It has applications in all the fields such as personal use, in government organizations such as defence, military etc. It has become popular because of presence of huge number of applications. Smartphones carry large amount of personal information, such as user's personal details, contacts, messages, emails, credit card information, etc. This sensitive information present, requires security and privacy.The project proposes the idea of securing the Personal information such as contacts, browsing history, cookies, credit card information etc, present on the user profile of a personalized search engine .Security is provided by locking and wiping the data of the phone from a remote server, in the event of phone getting lost or stolen.To achieve this we have used message authentication code technique. It uses a short piece of information which is used to prove the authenticity and integrity of the message. Integrity determines accidental and intentional message changes and authenticity determines the message's origin. It prevents malicious users from launching denial of service attacks. A Secure Hash Algorithm is used which produces a hash value which Converts plaintext to encoded message and outputs a MAC. The MAC protects both message data integrity as well as its authenticity by allowing receivers who also possess the secret key to detect any changes to message content.

KEYWORDS*:* Clickthrough data, abstraction, location search, mobile search engine, ontology, user profiling

I. INTRODUCTION

A major problem in mobile search is that the interactions between the users and search engines are limited by the small form factors of the mobile devices. As a result, mobile users tend to submit shorter, hence, more ambiguous queries compared to their web search counterparts. In order to return highly relevant results to the users, mobile search engines must be able to profile the users' interests and personalize the search results according to the users' profiles. A practical approach to capturing a user's interests for personalization is to analyze the user's clickthrough data [1], [2], [3], [4]. Leung, et. al., developed a search engine personalization method based on users' concept preferences and showed that it is more effective than methods that are based on page preferences [5]. However, most of the previous work assumed that all concepts are of the sametype. Observing the need for different types of concepts, PMSE, which represents different types of concepts in different ontologies.In particular, recognizing mobile search, separate concepts into location concepts and content concepts.

1) Problem - Interactions between the users and search engines are limited.
2) As a result, mobile users tend to submit shorter, hence, more ambiguous queries.
3) In order to return highly relevant results, mobile search engines must be able to profile the users' interests and personalize the results accordingly.
4) A practical approach to carry out this is to analyze the user's clickthrough data.
5) However, most of the previous work assumed that all concepts are of the same type.
6) Separate concepts into location concepts and content concepts to recognize information importance.

Most present day search engines have a deterministic behavior in the sense that they return the same search results for all users who submit the same query at certain time. They do not take the users interest and preferences into

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account in the retrieval process. Integrating user context in the retrieval process can help deliver more targeted search results, thereby providing a personalized search experience to the user. Personalizing web search involves the process of identifying user interests during interaction with the user, and then using that information to deliver results that are more relevant to the user. This approach involves building an ontological model of user interest on the user mobile device based on this interaction with web search results. Personalization of search results is achieved by re-ranking search results returned by a standard search engine(Yahoo)based on proximity to the users interestmodel. The ability to recognize user interest in a completely non-invasive way and the accuracy of personalized results are some of the major advantage of this approach.

II. RELATED WORK

Providing a way to check the integrity of information transmitted over or stored in an unreliable medium is a prime necessity in the world of open computing and communications.
Mechanisms that provide such integrity checks based on a secret key are usually called message authentication codes (MACs). Typically, message authentication codes are used between two parties that share a secret key in order to authenticate information transmitted between these parties. This standard defines a MAC that uses a cryptographic hash function in conjunction with a secret key. This mechanism is called HMAC and is a generalization of HMAC as specified in [6] and [7].

1) HMAC shall be used in combination with an Approved cryptographic hash function.
2) HMAC uses a secret key for the calculation and verifi-cation of the MACs. The main goals behind the HMAC construction [7] are:

a) To use available hash functions without modifi-cations; in particular, hash functions that perform well in software, and for which code is freely and widely available

b) To preserve the original performance of the hash function without incurring a significant degradation
c) To use and handle keys in a simple way

d) To have a well-understood cryptographic analysis of the strength of the authentication mechanism based on reasonable assumptions on the underlying hash function, and

e) To allow for easy replaceability of the underlying hash function in the event that faster or more secure hash functions are later available.

III. EXISTING SYSTEM

Most of the previous work assumed that all concepts are of the same type. Observing the need for different types of concepts, we present in this paper a personalized mobile search engine (PMSE) which represents different types of concepts in different ontologies. In particular, recognizing the importance of location information in mobile search, we separate concepts into location concepts and content concepts. To incorporate context information revealed by user mobility, we also take into account the visited physical locations of users in the PMSE. Since this information can be conveniently obtained by GPS devices, it is hence referred to as GPS locations. GPS locations play an important role in mobile web search.

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Disadvantages of the existing system

1) In an existing system, GPS location is in some difficul-ties.
2) Some obstacles in the privacy.

IV. PROPOSED SYSTEM

To store clickthrough ontology are used. Two types of ontologies are used; one for storing contents and other is for location. Once ontology is created then it atomically gets updated. Reranking is used for rerank the links that user visit and to show links as per user preferences. It matches the results which collected from backend search engine like Google, Yahoo, etc. and user preferences and rerank result issend to PMSE server.

SpyNB is prediction algorithm used for checking the query weather it is content or location concept.In PMSE's client-server construction, PMSE clients are dependable for storing the user clickthroughs and ontologies copied from the PMSE server. Easy tasks, like updating clickthoughs and ontologies, making feature vectors, and showing reranked search results are controled by the PMSE clients with less computational power.

On the another hand, difficult tasks, such as RSVM instruction and reranking of search results, are controled by the PMSE server. In order to reduce the data conduction between client and server, the PMSE client only need to submit a query together covering the feature vectors to the PMSE server, and the server automatically send a set of reranked search results depending on the priority in the feature vectors. The cost of data transmission is decreased, because only the crucial data (i.e., feature vectors, query, ontology and results of search) are broadcast between client and server at some point in the personalization process.

Search engine results & clickthrough data is used for ontology updating. Clickthrough data of user is collected from user search history. Implicit user profiles are created using extracted content concepts, location concepts & GPS data while explicit user profiles are self-managed by users. When a user gives a query on the mobile client, the query together with the user's content and location feature vectors are forwarded for training to assign weight vectors. These weight vectors will be used to rerank search results.

1) User can input query, explicit preferences, and location data using middleware.

2) Middleware will forward this data to the backend search engine which will provide search results.

3) These search results will be used for ontology updating & clickthrough data collection.

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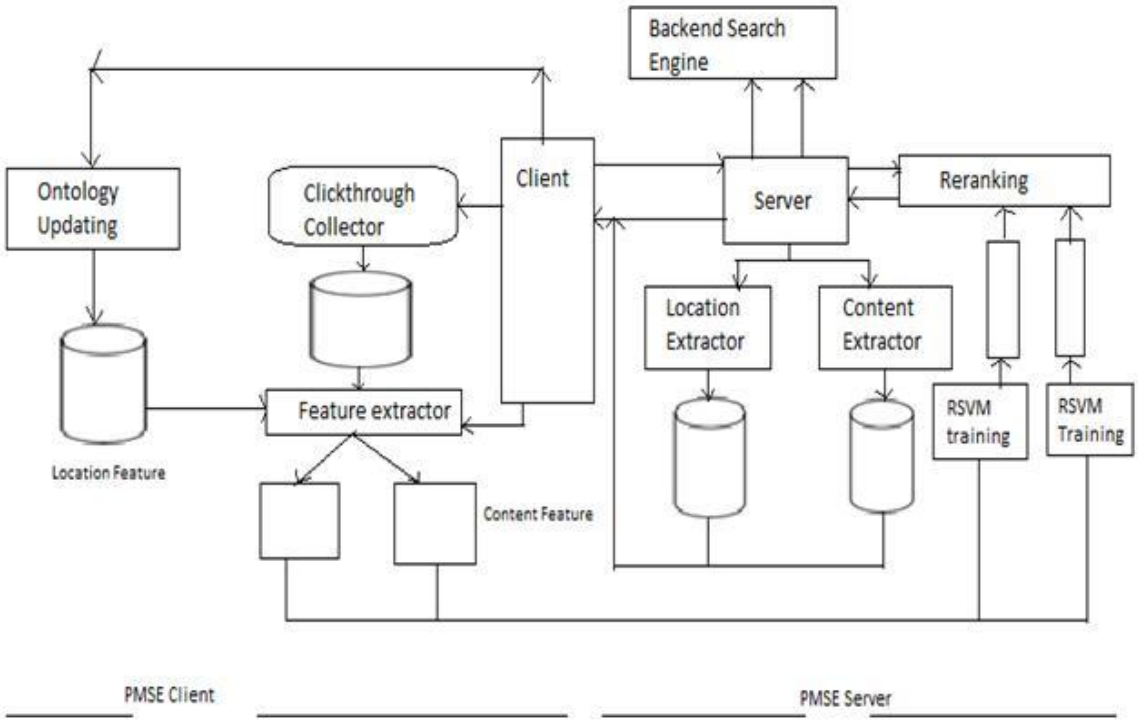

V. ALGORITHM

Algorithm 1 : Peer Search Step

1) Initially set number of peers required k = 4, Area(A) = Amin. // min area i.e search peers within min area.
2) Broadcast a request (containing ID of user U) to all neighboring peers.
3) Each peer generates a new record r that contains its ID, current location and a timestamp i.e. < p; (xp; yp); tp>.
4) Send record r to user U. // r is result

If ((NumPeer(List) <= k)&&(Area(A) < Amax)) For (i = 0; i <= NumPeer(List); i + +) // get (i)th records
a) Expand the Area (A) by adding some constant value.
b) Broadcast request to the peers.
c) Receive records from peers.
d) Update number of peers in List (i.e. k). End for
End if

If (NumPeer(List) = NULL)
Select the user as having the latest times- tamp.
End if

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5) Send the records in List, k, location of user U, Area(A) and ID of peer having latest timestamp to central server(i.e. Location Anonymizing Server).

Algorithm 2: Cloaked Area Step

1) If(NumPeer(List) > k) //i.e. is peers are found
a) Select one peer records.
b) Show a region A previously defined before search-ingpeer(to show that peer is within that region).
2) Else //if peers are not found
a) Set latest timestamp = ID of user U
b) Add some constant value to U's latitude and lon-gitude.
c) Determine region A = Amin //region will be-come min area previously defined in line 1 of algorithm 1.
End if

3) If(Area(A) >= Amin)
a) Return Area A as user's blurred location informa-tion.
b) Also return location of peer having latest times-tamp.
4) Else
a) Extend Area A by random distance.

b) Return Area A as user's blurred location informa-tion
c) Also return location of peer having latest times-tamp.
End if
5) Forward the request along with fake location information and bounded area to Location-based server.

Algorithm 3 : Ontology search Input: User query as Q

Output: Page with relevant output.

Step 1 : A signature S is a quadruple S = hC, P, R, Ii where C is a set of concept names, P is a set of object property names, R is a set of data property names, and I is a set of individual names. The union P [R is referred to as the set of property names.
Step 2 : Similarity Search Algorithm . Given two ontologies O1 and O2 and their signatures S1 = hC1, P1, R1, I1i and S2 = hC2, P2, R2, I2i, a similarity search algorithm is defined as

(S; SimString) ! T

where S = C2,P 2,R2,I2 is the search space such that T S. SimString S1 is a search string. T type should be same as SimString, i.e. SimString C1 will lead to T C2 and so on. By reducing the problem with just considering one name from S1 as SimString, we tried to keep the algorithm more general, so it could be used by other applications such as search engines, which need to find a concept in an ontology similar to a search text. For the sake of the simplicity, in the followings, we only refer to concepts but similar methods could be applied to search for other parts of signatures.

VI. IMPLEMENTATION AND RESULT

The user queries are stored as a clickthrough data collection in the client database. Using the clickthrough database user preference can be extracted through SPYNB technique. This preference can be analyzed with the result of

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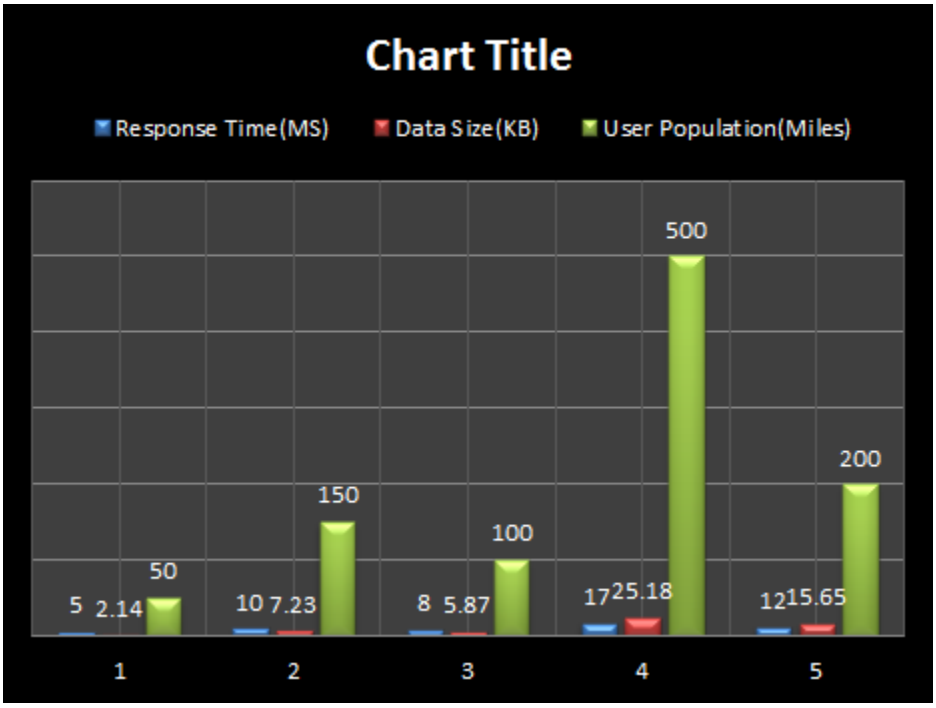
backend search engine and provided re-ranked search results using RSVM training. Thus the PMSE will provide efficient search results by supporting the multiple preference of the particular user. PMSE maintaining good ranking quality and the data transmission among the user and the search engine should guarantee quick and effective processing of the search.



VII. CONCLUSION

A personalized mobile search engine with enhanced security using MAC (Message authentication Code) technique is proposed . The experiments have been conducted on the Android Virtual Device. The Android device is remotely locked from a server and the device was set to restore factory to wipe the personal data from the device. Message authentication code technique was used to provide security, to prevent denial of service attack.A secret cryptographic key was generated which encrypted the message , the encrypted lock command was sent to the mobile device. The device decrypted the key and authenticated the message. After successful authentication the lock command was executed in the device and the access was denied to the device. We observed that security can beprovided to the sensitive data on the phone by denying access to it from a remote server and message authentication code technique will prevent malicious users from launching denial of service attack.

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