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Private Mobile Search Engine Using RSVM Training

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Abstract: **Smartphones have become very common. It has claims in all the fields such as private use, in government groups such as defence, military etc. It has become common because of occurrence of huge number of applications. Smartphones convey large amount of personal material, such as user's private details, contacts, messages, emails, credit card information, etc. This delicate material present, needs security and privacy. The project suggests the idea of securing the Private 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, message authentication code technique is used. The authenticity and integrity of the message is proved by a short piece of information. Integrity governs accidental and intentional message changes and authenticity governs the message's origin. It stops malicious users from launching denial of service attacks. A Secure Hash Algorithm is used to produce a hash value which Converts plaintext to encoded message and outputs a MAC.The MAC defends both message data integrity and its authenticity by permitting 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

To enhance security of user profile on personalized smartphone search engine by remote lock and wipe using message authentication code technique which uses cryptographic hash function and cryptographic key with message, the key is verified at the receivers end and confirms the source of message's origin[1]. The technique prevents malicious users from launching denial of service attack, and detects intentional and accidental message changes.

Smartphone devices have become very popular because of the presence of huge market of applications[2]. The new technology has also brought upon security and Privacy risks.This calls upon a need to make smartphones more secure and private[3]. A lot of private data is being stored in smartphones these days, This paper proposes a method to enhance security of the smartphone and also maintaining its integrity at the same time.

II. RELATED WORK

So far there have been many papers written & researched on search engines. There is tremendous evolvement in this field. But there is only one such paper written so far on Personalized Mobile Search Engine [PMSE].

In this paper, a realistic design for PMSE by adopting the metasearch approach which replies on one of the commercial search engines, such as Google, Yahoo, or Bing, to perform an actual search. Studies the unique characteristics of content and location concepts, and provides a coherent strategy using client-server architecture to integrate them into a uniform solution for the mobile environment. By mining content and location concepts for user profiling, it utilizes both the content and location preferences to personalize search results for a user.

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Difference between Existing system and proposed system:

- Most existing location-based search systems require users to manually define their location preferences or to manually prepare a set of location sensitive topics [4]. PMSE profiles both of the user's content and location preferences in the ontology based user profiles, which are automatically learned from the clickthrough and GPS data without requiring extra efforts from the user.
- Implement a new and realistic design for PMSE. To train the user profiles quickly and efficiently.
- Existing works on personalization do not address the issues of privacy preservation. PMSE addresses this issue by controlling the amount of information in the client's user profile being exposed to the PMSE server using two privacy parameters, which can control privacy smoothly, while maintaining good ranking quality[5].

III. MODULE DESCRIPTION

1. Mobile Client:

In the PMSE's client-server architecture, PMSE clients are responsible for storing the user clickthroughs and the ontologies derived from the PMSE server. Simple tasks, such as updating clickthroughs and ontologies, creating feature vectors, and displaying re-ranked search results are handled by the PMSE clients with limited computational power. Moreover, in order to minimize the data transmission between client and server, the PMSE client would only need to submit a query together with the feature vectors to the PMSE server, and the server would automatically return a set of re-ranked search results according to the preferences stated in the feature vectors. The data transmission cost is minimized, because only the essential data (i.e.,query, feature vectors, ontologies and search results) are transmitted between client and server during the personalization process.

2. PMSE Server:

Heavy tasks, such as RSVM training and re-ranking of search results, are handled by the PMSE server.

PMSE Server's design addressed the issues:

(1) limited computational power on mobile devices

(2) data transmission minimization.

PMSE consists of two major activities:

(1) Re-ranking the search results at the PMSE server

(2) Ontology update and clickthroughs collection at a mobile client.

3. Re-ranking the search results:

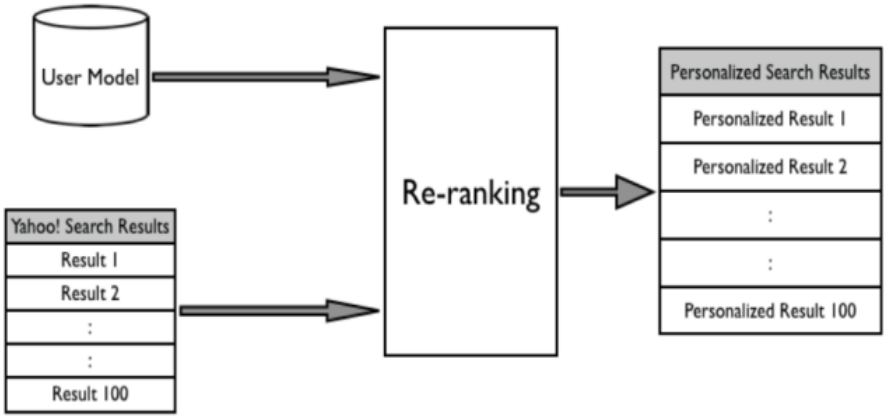

Fig.(1): Reranking the search results.

When a user submits a query on the PMSE client, the query together with the feature vectors containing the user's content and location preferences (i.e., filtered ontologies according to the user's privacy setting) are forwarded to the PMSE server, which in turn obtains the search results from the backend search engine (i.e., Google). The content and location concepts are extracted from the search results and organized into ontologies to capture the relationships between the concepts. The server is used to perform ontology extraction for its speed. The feature vectors from the client are then used in RSVM training to obtain a content weight vector and a location weight vector, representing the user interests based on the user's content and location preferences for the re-ranking. Again, the training process is performed on the server for its speed. The search results are then re-ranked according to the weight vectors obtained from the RSVM training. Finally, the re-ranked results and the extracted ontologies for the personalization of future queries are returned to the client.

IV. CLICK THROUGH COLLECTION

PMSE server contains the concept space that models the relationships between the concepts extracted from the search results. They are stored in the ontology database on the client. When the user clicks on a search result, the clickthrough data together with the associated content and location concepts are stored in the clickthrough database on the client. The click throughs are stored on the PMSE clients, so the PMSE server does not know the exact set of documents that the user has clicked on. This design allows user privacy to be preserved in certain degree. If the user is concerned with his/her own privacy, the privacy level can be set to high so that only limited personal information will be included in the feature vectors and passed along to the PMSE server for the personalization. On the other hand, if a user wants more accurate results according to his/her preferences; the privacy level can be set to low so that the PMSE server can use the full feature vectors to maximize the personalization effect.

V. USER INTEREST PROFILING

PMSE uses "concepts" to model the interests and preferences of a user. Since location information is important in mobile search, the concepts are further classified into two different types, namely, content concepts and location concepts. The concepts are modeled as ontologies, in order to capture the relationships between the concepts. The characteristics of the content concepts and location concepts are different. Thus, two different techniques are proposed for building the content ontology and location ontology. The ontologies indicate a possible concept space arising from a user's queries, which are maintained along with the clickthrough data for future preference adaptation. In PMSE,adopt ontologies to model the concept space because they not only can represent concepts but also capture the relationships between concepts. Due to the different characteristics of the content concepts and location concepts

VI. DIVERSITY AND CONCEPT ENTROPY

PMSE consists of a content facet and a location facet. In order to seamlessly integrate the preferences in these two facets into one coherent personalization framework, an important issue is that, to address is how to weigh the content preference and location preference in the integration step[6]. To address this issue, adjust the weights of content preference and location preference based on their effectiveness in the personalization process. For a given query issued by a particular user, if the personalization based on preferences from the content facet is more effective than based on the preferences from the location facets, more weight should be put on the content-based preferences; and vice versa. The notion of personalization effectiveness is derived based on the diversity of the content and location information in the search results, and the diversity of user interests the content and location information associated with a query . It can be used to effectively combine a user's content and location preferences for reranking the search results.

VII. IMPLEMENTATION AND RESULT

In the client database the user queries are stored as a click through data. User preference can be extracted through SPYNB technique using the clickthrough database[7]. This preference can be examined with the result of backend search engine and on condition that re-ranked search results using RSVM training.Thus the PMSE will delivereffective search results by secondary the multiple preference of the particular user. PMSE preserve good ranking quality and the data transmission among the user and the search engine should assurequick and effective processing of the search.

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VIII. CONCLUSION

The proposed personalized mobile search engine is an innovative approach for personalizing web search results. By mining content and location concepts for user profiling, it utilizes both the content and location preferences to personalize search results for a user.The results show that GPS location helps improve retrieval effectiveness for location queries (i.e., queries that retrieve lots of location information).

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