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Ontological Based Approach in Semantic Web

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Abstract — **In the Internet world users have unique background and a specific aim while searching for information on Internet. The aim of Semantic Web search is to tailor search results to a particularly based on the user's location, Profile and Click through pattern and preferences. An effective search result of information access involves two important challenges: accurately identifying the user context, and organizing the information in such a way that matches the particular ontologies. We present an approach for location and profile based search accuracy parameters by assigning implicitly derived precision and recall in different ontological approaches**.

Key Words — **Ontology, Semantic Web, RDF, OWL**

I. Introduction

In recent years, profile based search[1] has attracted interest in the research community as a means to decrease search ambiguity and return results that are more likely to be interesting to a particular user and thus providing more effective and efficient information access. One of the key factors for accurate profile based information access is user context. There are many factors that may contribute to the delineation of the user context [2], here we consider three essential elements that collectively play a critical role in profile based Web information access. These three independent but related elements are the user's short-term information need, such as a query or localized context of current activity, semantic knowledge about the domain being investigated, and the user's profile that captures long-term interests. Each of these elements are considered to be critical sources of contextual evidence, a piece of knowledge that supports the disambiguation of the user's context for information access. Approach for building ontological user profiles by assigning interest scores to existing concepts in an ontology. Our experimental results show that re-ranking the search results based on the interest scores and the semantic evidence in an ontological user profile successfully provides the user with a profile based view of the search results by bringing results closer to the top when they are most relevant to the user.

The semantic web is envisioned to facilitate integration of data available across various web applications, web servers through semantic web services.

The semantic information available with the service providers is in the RDF format. There is an increasing number of Location Based Services[3] available on the Web for the general public. However it is often not easy for a mobile user to find the right service, i.e. with the right functionality and possibilities for his or her specific purpose. In order for Location Based Services to be discovered (by humans or by intelligent 'search' agents or brokers) they will have to be described in a way that makes reasoning (matching of user requirements with service capabilities) possible.

Our approach follows partially the OWL Profile design. For the common reference of locations we have created location ontology in OWL and opted for a flexible setup in which we reuse parts of standards and allow for plugging-in existing.

Web based ontologies or models such as feature type classifications of national mapping agencies (e.g. the Dutch Top10NL) and GML [6] object geometries types that we expect to be modeled in the OWL family of languages soon. The scope of our ontology is limited to the aspects of geo-locations which are considered to be basic entities for Location Based Services. Together forming one diagram shows core part of our ontology, exposing the concepts that are essentially used for differentiating the operations' data inputs and outputs with service matchmaking as our primary goal. The diagram is a graphic representation of the OWL code in the Protégé software environment. Central in this ontology is the *feature* concept. The feature concept can have a coordinate identifier (e.g. latitude, longitude) or a geographic identifier (e.g. a postal code number) as its location identifier. This is essential to distinguish between, for instance, LBSs that take either coordinates or addresses as inputs. Further, the ontology contains concepts that support specific format with respect to the service matching process in case we want to match the description of a service taking a full address and one supporting only postal code areas, then the ontology concept *Geo-id elements* is used in the matching.
Example 2 (geometry):
A service that expects a town18 to be a polygon will not take a point as input.

Example 3 (theme): The type of thematic queries depends on the attribute model of the data embedded in the service. If the matching focus is of such thematic character, we have to include the feature type classification concept in the matching process.

II. Challenges in ontology

Effective profile based ontology of information access involves two important challenges: accurately identifying the user context, and organizing the information in such a way that matches the particular context. Users often settle for the results returned by imprecise queries, picking through them for relevant information, rather than expending the cognitive effort required to formulate more accurate queries.

III. IMPLEMENTATION

The notion of *context* may refer to a diverse range of ideas depending on the nature of the work being performed. Previous work defines context by using a fixed set of attributes such as location, time or identities of nearby individuals or objects, as is commonly done in ubiquitous computing. In this section, we define more precisely what we mean by *context* and other related terminology used in the paper.

Context: The representation of a user's intent for information seeking. We propose to model a user's information access context by seamlessly integrating knowledge from the immediate and past user activity as well as knowledge from a pre-existing ontology as an explicit representation of the domain of interest. In our framework, *context* is implicitly defined through the notion of ontological user profiles, which are updated over time to reflect changes in user interests. This Feature article

Learning Ontology-Based User Profiles: A Semantic Approach to Personalized Web Search Ontological User Profile as the Context Model representation distinguishes our approach from previous work which depends on the *context* information to be explicitly defined.

Ontology: Ontology [4] is an explicit specification of concepts and relationships that can exist between them. When the knowledge of a domain is represented in a declarative formalism, the set of objects that can be represented is called the universe of discourse. This set of objects, and the describable relationships among them, are reflected in the representational vocabulary with which a knowledge-based program represents knowledge [5]. The set of relations such as assumption *is-a* and acronym *part-of* describe the semantics of the domain. Rather than creating our own ontology, we choose to base our reference ontology on an existing hierarchical taxonomy; a tree-like structure that organizes Web content into pre-defined topics.

Query: A search query consisting of one or more keywords and is the representation of a user's short term
or immediate information need.

Location Based:

The ability of receiving locations is the fundamental requirement for all location-based applications. Android allows its emulator to receive a location (including longitude and latitude) from the DDMS (Dalvik Debug Monitor Server). The DDMS can be activated from the standard toolbar of Eclipse or by selecting the following options of Eclipse:

a. Select the Window menu.

b. Select the Open Perspective option.

c. Select the DDMS option.

d. Fill in the longitude and latitude values and click the Send button.

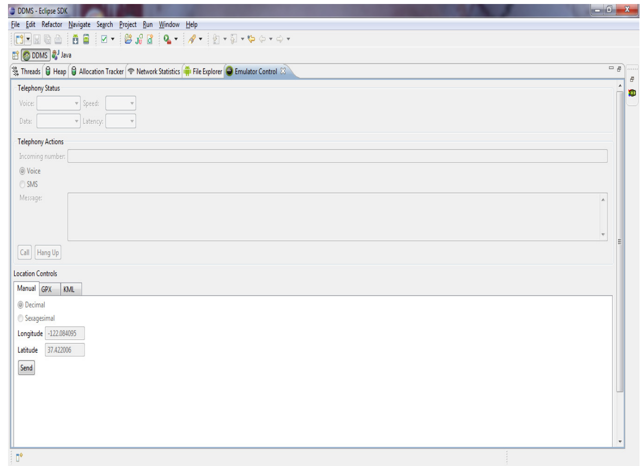


Figure 1: Setting the Longitude and Latitude for Location Based

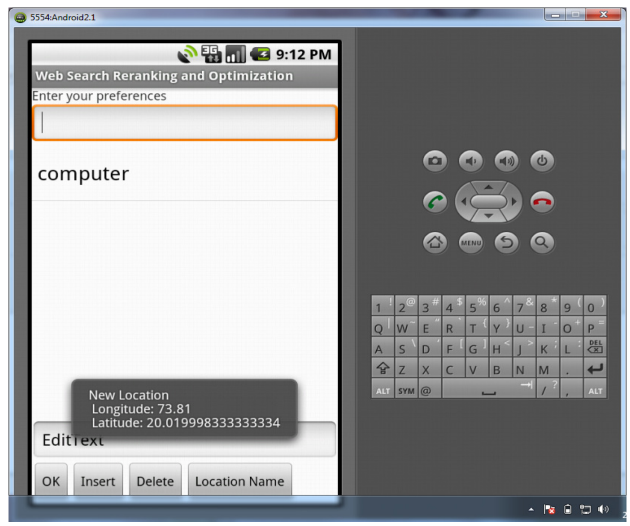


Figure 2: Get the Longitude and latitude

Web users tend to be short and ambiguous our goal is to demonstrate that re-ranking based on ontological user profiles can help in disambiguating the user's intent particularly when such queries are used.

Profile based search experiments, we measure the effectiveness of re-ranking in terms of *Top Recall* and *Top Precision*. For example, at n = 100, the top 100 search results are included in the computation of recall and precision, whereas at n = 90, only the top 90 results are taken into consideration. Starting with the top one hundred results and going down to top ten search results, the values for *n* include n = {100, 90, 80, 70, ..., 10}. The *Top Recall* is computed by dividing the number of relevant documents that appear within the top *n* search results at each interval with the total number of relevant documents for the given concept.

Total Recall= No of relevant retrieved result/ No of relevant documents

We also compute the *Top Precision* at each interval by dividing the number of relevant documents that appear within the top *n* results with *n*.

Total Precision= No of relevant retrieved result in n/ n

IV. Results

Precision and **recall** are the basic measures used in evaluating search strategies. As shown in the first two figures on the left, these measures assume:
There is a set of records in the database which is relevant to the search topic Records are assumed to be either relevant or irrelevant. The actual retrieval set may not perfectly match the set of relevant records.

The purpose of the overlap queries is to simulate real user behavior where the user enters a vague keyword query as the search criteria. Our evaluation results verify that using the ontological user profiles for personalizing search results is an effective approach. Especially with the overlap queries, our evaluation results confirm that the ambiguous query terms are disambiguated by the semantic evidence in the ontological user profiles.
With the user profile and accuracy experiments, we have evaluated the stability of our approach separately from its performance in terms of Web search personalization. We have validated the interest propagation within the user profiles and demonstrated the effectiveness of profile normalization, especially in the case of mixed interests

Figure 3: Search Result Screen

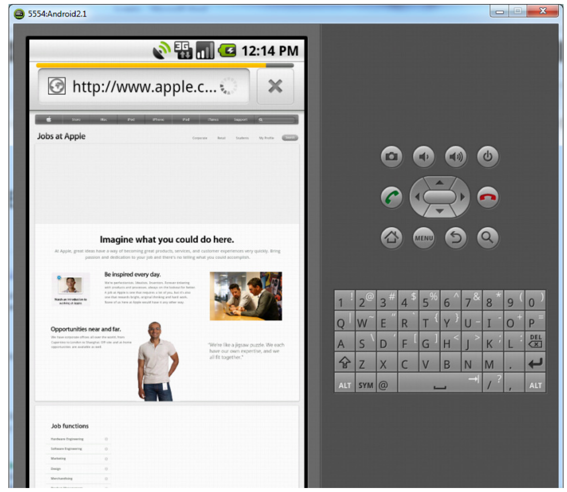


Figure 4- Click through Pattern Screen

Result				
Location	**Profile**	**Search Preferences**	**Ontolog y**	**Googl e**
Nagpur	Computer	Orange	14	15
Nagpur	Computer	Apple	15	18
Nagpur	Computer	Cdac	2	2
Nagpur	Travel	Khurana	11	13
Nagpur	Travel	Baba	4	4

Table-1: Result after Setting Location, Profile and Search Preferences.

Precision				
Location	**Profile**	**Search Preferences**	**Ontology**	**Google**
Nagpur	Computer	Orange	0.35	0.45
Nagpur	Computer	Apple	0.3	0.35
Nagpur	Computer	Cdac	0	0.2
Nagpur	Travel	Khurana	0.2	0.3
Nagpur	Travel	Baba	0	0.2

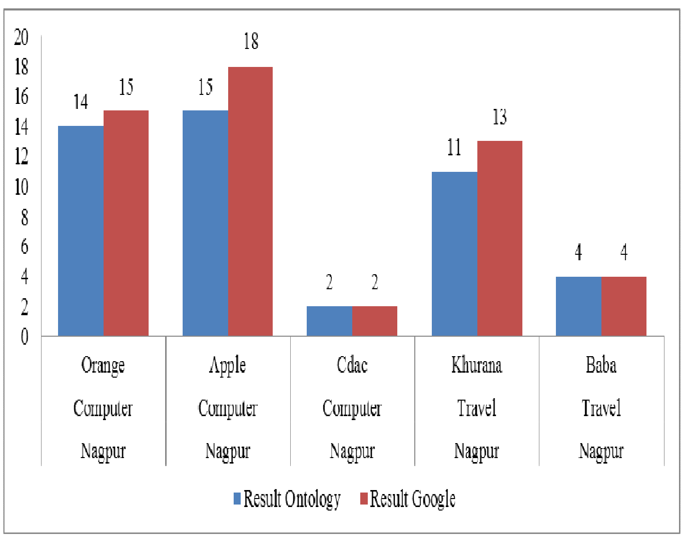
Table-2: Precision after Setting Location, Profile and Search Preferences.

Recall

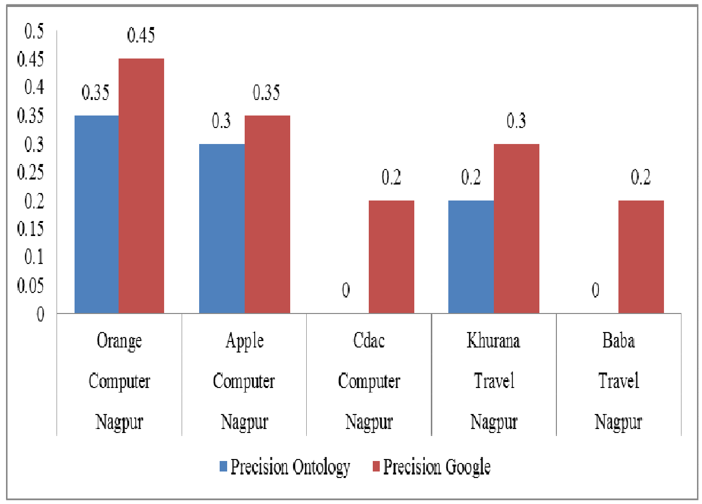
Location	Profile	Search Preferences	Ontology	Google
Nagpur	Computer	Orange	0.02	0.1
Nagpur	Computer	Apple	0.01	0.1
Nagpur	Computer	Cdac	0	0.01
Nagpur	Travel	Khurana	0	0.05
Nagpur	Travel	Baba	0	0.02

Table-3: Recall after Setting Location, Profile and Search Preference.

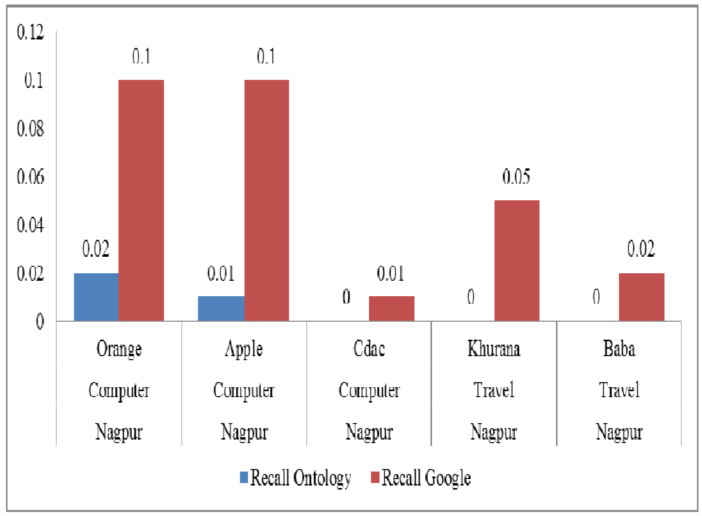
Table shows the precision and recall with result of ontological approach and Google. From this we can infer that the higher value of average precision and recall for our system of ontological approach when compared to Google describes that our system has a better performance and accuracy in retrieving the results than the generic search engines.



Graph 1: Result analysis after setting ontologies.



Graph 2: Precision analysis after setting ontologies.



Graph 3: Recall analysis after setting ontologies.

CONCLUSION

Our evaluation results verify that using the ontological user profiles for personalizing search results is an effective approach for profile based location based and Click through based. Especially with the overlap queries,

Our evaluation results confirm that the ambiguous query terms are disambiguated by the semantic evidence in the ontological user profiles. With the user profile and accuracy experiments, we have evaluated the stability of our approach separately from its performance in terms of Web search personalization.

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REFERENCES

[1] Awes Siddiqui , Prof. P. A. Tijare, "ONTOLOGICAL Approach For Improving Semantic Web Search Results," IJRET , January 2013.

[2] P. Nandhakumar M. Hemalatha, "Adorning Web Search based on Ontology Semantics Spaces Provisioned through Web Services," in *International Journal of Computer Applications*, October 2012.

[3] Fabrizio Lamberti,Andrea Sanna, and Claudio Demartini, " A Relation-Based Page Rank Algorithm for Semantic Web Search Engines",IEEE Transactions on Knowledge and Data Engineering, 2009.

[4] Hyun-suk Hwang, Seong-hyun Shin, Ki-uk Kim, "A Context-aware System Architecture using Personal Information based on Ontology," Fifth International Conference on Software Engineering Research, Management and Applications, 2008.

[5] Sieg, B. Mobasher, and R. Burke, "Web search personalization with ontological user profiles," in *ACM Sixteenth Conference on Information and Knowledge Management, CIKM 2007*, Lisbon, Portugal, November 2007.

[6] Yufei Li, Yuan Wang, and Xiaotao Huang,"A Relation-Based Search Engine in Semantic Web",IEEE Transactions On Knowledge And Data Engineering, VOL. 19, NO. 2, FEBRUARY 2007.

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