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EFFECTIVE WEB BASED E-LEARNING

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Abstract

The goal of Effective Web based E-Learning is to bridge the gap between the currently popular approach to Web-based education, which is centered on learning management systems (LMS) vs. the powerful but underused technologies in intelligent tutoring and adaptive hypermedia. Ontologies have become a key technology for enabling semantic-driven resource management. We present a sub ontology-based approach for resource reuse by using an Evolutionary algorithm.

Introduction

A key, overarching goal for any committed educator is to ensure that the learner has a meaningful and memorable learning experience while achieving the desired learning outcomes. In this paper it is argued that in order to achieve such a goal, a strategy needs to be put in place that is capable of providing students with a fully integrated, all-encompassing learning environment. The reasoning, simply, is that learning will not necessarily emanate from one specific source and when it happens, it will occur through different means, for different people. One of the great strengths of the online learning space is that, harnessing the power of the various information and communication technologies (ICTs), there is greater scope for catering for individual learning needs. With this in mind, the paper puts forward a framework that comprises a number of overlapping 'sub-environments' which, together, provide the scaffolding considered essential for the construction of a truly holistic learning environment. Learning Management System (LMS) – a collection of eLearning tools available through a shared administrative interface. A learning management system can be thought of as the platform in which online courses or online components of courses are assembled and used from.

Semantic Web Views

The goal of the semantic web is to develop enabling standards and technologies designed to help machines understand more information on the web so that they can support richer discovery, data integration, navigation, and automation of

tasks. With semantic web we not only receive more exact results when searching for Information, but also know when we can integrate information from different sources, Know what information to compare, and can provide all kinds of automated services in different domains from future home and digital libraries to electronic business and Health services.

Ontology Views

Ontology is a document or a file that formally defines the relations amongst the terms. The main uses for ontologies are to enhance the accuracy of web searches. The writers also define what a URI (Universal Resource Identifier) and a URL (Uniform Resource Locator) are and their functions in the semantic web. URL's are the most familiar type of a URI. Ontologies constitute an integral and important part of the Semantic Web. For the Semantic Web to succeed, developers must create and integrate numerous ontologies, from general top-level ontologies, to domain-specific and task-specific ontologies.

One of the original motivations behind ontology research was the belief that ontologies can help with reuse in knowledge representation. Ontologies and Semantic Web Services are the two core technologies of the Semantic Web. The Semantic Web hinges on the ability of computer programs to perform some task involving the autonomous resolution of semantic issues. This ability requires providing standard access for software to ontologies. Moreover, for the Semantic Web to gain widespread acceptance, it needs to reach a critical mass of applications that can interact. This last point requires providing standard access to functionalities for manipulating ontologies. Therefore, it is relevant to bring ontologies and Web Services together by providing access to ontologies through Semantic Web Services.

We analyze different kinds of ontology-manipulation functionalities that could be implemented as ontology Web Services (OWS). We then propose an architecture allowing programs to insert calls to ontology Web Services into the more general framework of Web Services. We show that this architecture is a necessary complement to OWL-S for Semantic Web applications to perform dynamic discovery and invocation of Web Services, thus addressing a key requirement of the Semantic Web. We then demonstrate the scalability of our architecture as it allows the composition of (ontology) Web Services for performing complex tasks. Currently, there are several efforts to develop standard reusable ontologies in various domains and to make them available on the Semantic Web: from the generic upper-level ontology of SUO and lexical corpus of Word Net to domain-specific ontologies such as UMLS.

Existing System

Existing works for Semantic-Web- or ontology-based e-learning tend to use ontologies or semantic models statically to mediate e-learning resources or improve e-learning behaviors. An e-learning system needs to compose relevant resources together in order to achieve on-demand and collaborative e-learning in the Web. However, there exists the heterogeneous representation problem to various e-learning resources in the Web.

Disadvantages

- We cannot get only the original data. Here we get necessary data and unnecessary data also.
- So this is time consuming process.

Proposed System

In contrast to the above and the approaches reviewed earlier, our work on e-learning Resource management relies on a SubO-based approach that reuses large-scale ontology dynamically. The way we integrate e-learning resource by semantic mapping is Similar with existing research on ontology-based mapping or integration of e-learning resources; however, we have extended the approach with a dynamic SubO evolution Mechanism for resource reuse. To contrast it with ontology modularity and ontology evolution, our concern of SubO evolution is inclined to evolve the resource repository of the e-learning system based on GA.

Advantages

- *We provide a semantic mapping mechanism to integrate e-learning databases by using ontology semantics. E-learning databases can be integrated under a mediated ontology.
- * We define the SubO by taking into account the locality of resource reference. We propose to represent those context-specific portions from ontology as SubOs.
- * We propose a SubO-based resource reuse approach based on an evolutionary algorithm. It will improve the local knowledge structure of e-learning systems, which can reuse SubOs to achieve adaptive resource management.

It Consist of following process steps,

Extract

Encode

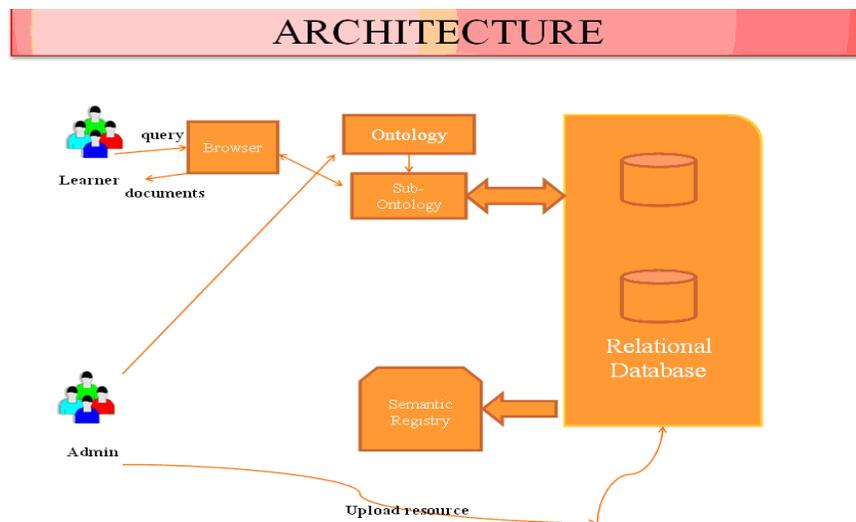
Population Evaluation

Decode

Store

Compare

Retrieve



Problem Representation

As a kind of evolutionary computation, the theoretical foundations of GA were originally proposed by Holland in the early 1970s. It applies some of the natural evolution principles like crossover, mutation, and survival of the fittest to optimization and learning. GA has been applied to many problems of optimization and classification. We adopt GA here to solve the problem of SubO evolution to support dynamic resource management and reuse. For mapping our problem to the GA formulation, two steps are needed to be performed, namely, problem encoding and determining the evaluation/fitness function based on the ontology semantics. In GA, a chromosome is composed of a list of genes, and a set of chromosomes groups together as a population. Problem encoding in GA is to map the problem space to the parameter space. In the problem of SubO evolution, It refers to how to represent SubOs as chromosomes. Being a subset of ontology is a common feature of SubOs from the same source ontology. It means that what we want to evolve is a collection of subsets of the same ontology. We take the source ontology as the problem space and map it to an encoding space that consists of characters 0 and 1. Given that the number of classes of a source ontology is n , the length of chromosome is also n . Each class appearing in the SubO will have the corresponding allele (gene) in the corresponding chromosome set to 1 or 0 otherwise.

Evolution Algorithm

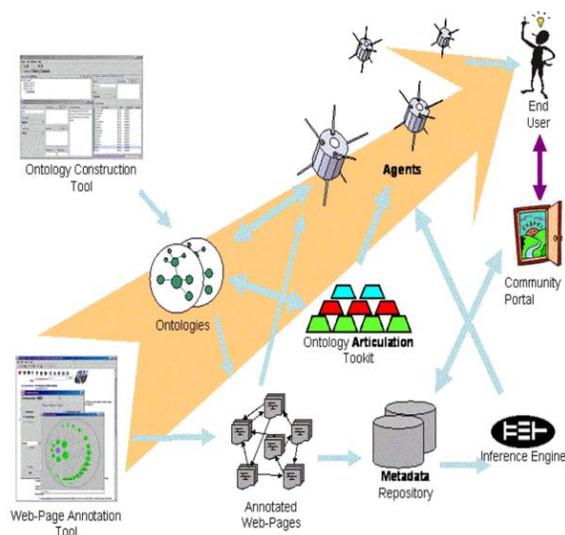
Based on the problem encoding and the fitness function, we propose an algorithm for SubO evolution. The following algorithm evolves a set of SubOs based on a set of resource requests and gets a new set of SubOs for resource reuse.

Algorithm: Sub Evolve(K, R, O) STEPS

The evolution algorithm is explained as follows:

1. Retrieve different SubOs from a repository or extract different SubOs from the source ontology according to different resource requests.
2. Encode SubOs as a population of chromosomes.
3. Evolve the population based on GA.
4. Compare the chromosomes in the population and merge ones with high similarity.
5. Evaluate the chromosomes in the population. Terminate if the overall fitness is higher than a threshold value. Otherwise, go to step 3.
6. Decode the chromosomes in the population to SubOs and return a new set of SubOs.
7. Retrieve e-learning resources related to the SubOs.

We can improve the resource management and reuse for e-learning systems based on the SubO evolution algorithm. The local knowledge structure of e-learning systems becomes more adaptive to resource requests via SubO evolution.



Use of metadata on the Semantic Web.

Conclusion

We propose a dynamic SubO mechanism for the adaptive management and reuse of e-learning resources in a distributed environment like the Web. We argue that to achieve the on-demand semantic-based resource management for Web-based e-learning, one should go beyond using domain ontologies statically. We propose a semantic mapping mechanism to integrate e-learning databases by using ontology semantics. We define context-specific portions from the whole ontology as SubOs and propose a SubO-based resource reuse approach by using an evolution algorithm. We explain the GA-based evolution algorithm for dynamic e-learning resource reuse in detail. We also conduct a simulation experiment and evaluate the proposed approach with a TCM e-learning scenario. The proposed SubO-based approach for e-learning resource management and reuse is far from being mature.

Future Research

However, e-learning is also a widely open research area, and there is still much room for improvement on the method.

Future research issues include

- 1) Improving the proposed evolution approach by making use of and comparing different evolutionary algorithms,
- 2) Applying the proposed approach to support more applications,
- 3) Extending to the situation with multiple e-learning systems or services.

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