

Implementation of Knowledge Mining with Ontology

Vishal Jain¹ and Mahesh Kumar Madan²

¹Research Scholar, Computer Science and Engineering Department, Lingaya's University, Faridabad

²Professor and HOD, Computer Science and Engineering Department, Lingaya's University, Faridabad

¹vishaljain83@ymail.com, ²mahesh.madan@gmail.com

Abstract

Today, huge amount of data available on the web in the form of unstructured, semi-structured and unstructured data. With the use of ontology we can make structured data and use of knowledge mining. As, the knowledge mining is used in many fields of study such as in science and medicine, finance, manufacturing and commerce. In this paper we are trying to discuss some issues of knowledge mining with the help of ontology and its use in cloud computing.

Keywords: Knowledge Mining, Ontology, Cloud Computing

Introduction

Cloud computing involves offering of services via internet. These services include sharing of software, applications and computer hardware. We have three types of cloud computing; private, public and hybrid cloud. The private cloud is used by the company or the organization internally whereas public cloud the organizations have to pay to access the services. Hybrid cloud entails both the private and public clouding (Antonopoulos and Gillam, p. 3). Ontology describes the ideas, relationships, classes and features that are applicable in developing a domain (Munn and Smith, p. 22). Knowledge mining is the process of merging databases together, machine knowledge, statistics and any other linked area so as to obtain important facts and information in bulky quantity of data. Organizations are required to know their data models and pattern (NEMIS. Conference, p. 1). Multi agent mining is the process in which knowledge is mined in a larger quantity using a variety of agents.

Cloud Computing Applications

In cloud computing the remote computer does not have to do more and heavy processes any more when running processes. Servers on the cloud network run this processes instead. This help in reduction of user's need for hardware and software. The following are more reasons to why most companies and organizations should consider cloud computing; cloud computing gives an alternative of storing data in another computers hardware. Computer users are able to gain access their data and applications wherever at anytime. Cloud computing reduces IT support expenses whereby incase of a technical issue it's solved online. It also reduces cost on hardware such as hard drive. One does not have to buy a hard drive with large memory (Strickland, p. 3).

We have a number of cloud computing services provided by Google. The applications are as follows: Google Talk is a communication application that allows personal computer user to chat, send and receive documents and mails. Gmail is a calendar and an email application that allows each user store files and documents up to 7GB. The other Gmail services are ability to chat, receive mails and enjoy mutual calendar options. Website applications provides Google site services to design websites that include built in videos, calendars and pictures. Google Docs are applications that offer document designing and sharing online. Other applications include groups that allow one to arrange folders and favorites which assist in retrieving the unread mails (Regina, Budnikas and Ambraziene, p. 263).

A Matlab tool accelerates and eases applications when using GPU computing compared to when using FORTRAN or C. The user is able to employ parallel computing toolbox when using GPUs in conjunction with Matlab tools. Parallel computing supports Nvidia Cuda GPUs, many GPUs and GPU operate straight from Matlab. Parallel computing toolbox allows the user compute and work out bulky data difficulties using computer clusters, multi processors and GPUs (MathWorks, p. 1-7). Other cloud computing tools include; VOIP, Phone systems, Blog, Wiki and social media tools. VOIP allows users make calls on the internet, for example Skype. Skype allows multiple or group calls at once. The phone system allows one to have a Google voice account that contributes to a cloud based voice mail and responding system.

(Jamsa and Jamsa, p. 86- 92).

Ontology Applications

Ontology is used to design and manage the knowledge applications. These applications are associated with the phase of software lifecycles and are concerned with specific components of software such as the controller module, data base and user interface. In order for the application to work more efficiently in ontology

deployment and processing, additional tools are used. The ontology editor is one of the applications in the web and is used to manipulate ontology as it helps in the process of ontology translation to implemented language. They are in the HTML form and enable the users to access issues concerning the ontology such as the ontology libraries. They can also browse on how to import and export ontologies to and from different languages (Pérez, López and Corcho, p. 301).

The ontology tools help to enhance the access of information and to ensure that the work is more efficient and effective. Some of the tools are ontology-based annotations that enable the sources of information that have semi structured and unstructured information to be linkable with ontologies. Example of such a tool is SHOE knowledge annotator that helps to manage the annotations and ontologies. Other tools include the ontology merging and reuse tools that help to create new and more unique ontologies by reusing the original ones such as PROMPT. This tool helps in the process of merging.

The ontology languages such as the OWL (Ontology Web Language) and this include RDF and XML helps in the representation and expression of ontologies. These languages provide the ressoner with uniform formalism. The ontology tools that are semi automatic help in the creation of new ontologies. Tools that are ontology based are helps to access information. The tools also help in the navigation of information that enables the users to access intelligent information (Fensel, p. 47).

Knowledge Mining

Knowledge mining applications are used to extract knowledge. The knowledge mining is used in many fields of study such as in science and medicine, finance, manufacturing and commerce. The data mining tools are used to extract data from decision support systems models and the related cases. The tools facilitate the analysis tasks. These tools include software tools that are powerful. The tools are classified according to the data methods and tasks available, data structures and the user groups. They are also classified according to the human-computer interactions and visualization styles among other categories. The tools for knowledge mining are increasing and therefore the researcher is purposed to choose a suitable tool according to the knowledge being mined as it is tricky to get to a conclusion at which would be the best tool (Mikut and Reischl, p. 1). The tools formalize the data extraction results in a more systematic way. They also help to specify the functions of the mining evaluation.

Multi Agent Data Mining Application

Cole is one of the multi-agent models that are used in data extractions. It is a cooperative agent that mines knowledge from heterogeneous data. It is one of the models that promoted the cooperation of several mining agents and the collection of data mined into proper knowledge structures. This is an application that can not be handled by one particular mining agent. It is an example of a multi-agent model that helps to organize the data discovered by mining agent in a way that the other agents can be able to continue with the data extraction from that point. There are models that make use of the genetic algorithm. They help to enhance the quality of the knowledge mined by mining and developing event sequence conditions in the hybrid rules that are designed. (Gao, Denzinger and James 93)

The multi agent mining application helps to manage a larger quantity of data that an individual agent by controlling the processors and the power of its numbers. It also ensures that the task at hand is completed as it is a cooperation of several agents. They are well developed and established technologies that assist in the process of data extraction. They include the clustering, user, validation and data agents. The agents help to the user to access, represent, cluster and validate the results of the data mined (Cao, Bazzan and Symeonidis, p. 16-18).

Proposed Models for Knowledge Mining

Some of the proposed models include the conditional random fields and the Hidden Markov model as they are very promising in the process of data extraction. They are more reliable and they work more efficiently and effectively because they are more advanced.

Conclusion

Knowledge mining is very essential in all fields. It is a way of researching of surveying so as to get more information of a certain issue. There are many ways in which the knowledge is extracted such as the cloud computing, ontology, knowledge mining and the multi agent mining that helps in the process of data mining. The clouding computing is good for the reducing the expense during the extraction of data and the knowledge mining tools have been used in many applications including the science and medicine fields. The multi agent mining increases the number of the data collected as it combines the work of several agents. It reduces the time taken to extract data and enhances the quality of data mined. The ontology helps to manage the knowledge collected. It has tools such a languages that help in the presentation and the expression of data. It makes the process on mining even easier as there are websites that enable the user to access and browse topics related to the ontology by the help of the ontology editor that helps in those processes. There are other models that are

recommended for the data mining as they increase and enhance the quality of the knowledge being mined and also make it more reliable and effective. Some of the models that have shown a lot of potential are the Hidden Markov Model and the conditional random fields. This shows that the tools of knowledge mining are advancing and increasing as well and the applications are also numerous.

References

- [1] Antonopoulos, Nick and Lee Gillam. "Cloud Computing: Principles, Systems and Applications". New York: Springer, 2010.
- [2] Cao, Longbing, et al. "Agents and Data Mining Interaction". Heidelberg: Springer, 2012.
- [3] Fensel, Dieter. "Ontologies: A Silver Bullet for Knowledge Management and Electronic Commerce". Heidelberg: Springer, 2003.
- [4] Gao, Jie, Jörg Denzinger and Robert C. James. "A cooperative multi-agent data mining model and its application to medical data on diabetes." AIS-ADM 2005 Proceedings of the 2005 international conference on Autonomous Intelligent Systems: agents and Data Mining. Heidelberg: Springer, n.d. 93-107 .
- [5] Jamsa, Kris A. and Dr. Kris Jamsa. "Cloud Computing. Burlington: Jones & Bartlett Publisher", 2012.
- [6] MathWorks."ParallelComputingToolbox."2012. www.mathworks.com. 11 June 2012 <<http://www.mathworks.com/products/parallel-computing/>>.
- [7] Mikut,RalfandMarkusReischl."Dataminingtools."9March2011.11 June 2012 <<http://wires.wiley.com/WileyCDA/WiresArticle/wisId-WIDM24.html>>.
- [8] Munn, Katherine and Barry Smith. "Applied Ontology: An Introduction". Heusenstamm: ontos verlag, 2008.
- [9] NEMIS. Conference. "Knowledge Mining: Proceedings of the Nemis" 2004 Final Conference. Bayern: Birkhauser, 2005.
- [10] Pérez, Asunción Gómez, Mariano Fernández López and Oscar Corcho. "Ontological Engineering". heidelberg: Springer, 2004.
- [11] Regina, Miseviciene, Germanas Budnikas and Danute Ambraziene. "Application of Cloud Computing at KTU: MS Live@Edu Case." Informatics in Education 10 .2 (2011): p259-270.
- [12] Strickland, Jonathan. "How Cloud Computing Works." ND. howstuffworks. 2012 June 10 <<http://computer.howstuffworks.com/cloud-computing/cloud-computing2.htm>>.