Discovering browsing paths on the web

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Abstract:

This paper addresses the problem of being able not only to retrieve documents about a given subject or matching a given description, but to allow a browsing across clusters of documents. This work in progress is based on a first experience of an authoring tool described in the first part of the article.

Learner models, and learner environments in web-based learning

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Abstract. The paper considers the kind of learners for whom web-based open and distance learning (WEB-ODL) is appropriate and identifies the hybrid learner as a new category of learner with some of the characteristics of traditional learners, and some of distance learners. Particular attention is paid to the educational applications of the mobile internet and the kind of learners who may benefit from mobile services.

Automatic Searching of Texts Using Conceptual Dependency

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Abstract:

A method is being investigated at the University of Portsmouth for the automatic assessment of student examination answers in typed text, making use of the conceptual dependency approach developed by Schank in the early days of artificial intelligence. The method consists of breaking down an examiner's model answer into its basic concepts and dependencies, and doing the same with a student's answer, then comparing the two.

This technique can be extended to analysis of web documents. Texts on the web could be broken down into conceptual form, so that when a searcher makes an inquiry, it is also broken down into conceptual form, and a search is made for a match of concepts. The method offers a powerful technique for complex searches, but it depends on a fast, efficient method of analysis. Some progress has been made at Portsmouth towards devising such a method, using Prolog, and this paper constitutes a progress report on the method.

Keywords: Web Mining, Text Mining, Web Based Learning, Computer Aided Assessment, Natural Language Processing, Prolog, Logic Programming.

HyWebMap, a system to create interactive networks

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Abstract:

The Web is an open, evolutionary and heterogeneous information space. To exploit this heterogeneous space and better orientate the reader, we developed the HyWebMap system which allows: orientation in the space visited by using a benchmark tool, a browser, a history tool and a global image display based on an interactive map. The reader can create a personal space starting from the spaces visited and enrich it by adding and renaming links. HyWebMap allows the reader to add nodes and annotations to personalise his space. HyWebMap notifies and assists the reader when a change occurs in his personal space.

Keywords: virtual network, agents, annotation, navigation, reorganization, nodes, links, Web tools

Free-Text Assessment in a Virtual Campus

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Abstract:

Current web-based learning environments (such as *WebCT* or *LearningSpace*) are better at presenting the content than assessing the learning. Indeed, these environments provide sophisticated access to learning content by means of images, videos, sounds, hypertexts, glossaries, etc. However, their main weakness lies in the assessment part. Either the tests are based on rigid technologies such as quiz or multiple-choice questions (MCQ), or a teacher is required to manage forums or asynchronous e-mail exchanges. In this article we present *Apex*, a module of a web-based learning environment which is able to assess student knowledge based on the content of free texts. The goal of this module is not just to grade student productions but rather to engage students in an iterative process of writing/assessing at a distance. In addition to the preparation of their courses, teachers are required to partition them, to design exam questions, and to select the parts of the course that cover these questions. All courses, questions and student essays are managed by a database which is part of *Apex*. The assessment relies on Latent Semantic Analysis, a tool which is used to represent the meaning of words as vectors in a high-dimensional space. By comparing an essay and the text of a given course on a semantic basis, our system can measure how well the essay matches the course. Various assessments are presented to the student regarding the content, the outline and the coherence of the essay. These assessments provide a more authentic feedback than those currently provided by MCQ in virtual campuses.

Keywords: Computer-Assisted Assessment, Automatic Essay Grading, Latent Semantic Analysis, Virtual Campus.

Résumé :

Les environnements d'apprentissage à distance tels que *WebCT* ou *LearningSpace* sont plutôt destinés à communiquer un contenu qu'à évaluer l'apprentissage. Leurs fonctionnalités de présentation d'un contenu par image, vidéos, sons, hypertextes, glossaires, etc. sont bien plus riches que leurs fonctionnalités d'évaluation : les tests qu'ils proposent sont en général basés sur des QCM, ou bien ils nécessitent de l'enseignant un important travail d'évaluation en ligne, par forum ou courrier électronique interposés. Nous présentons ici *Apex*, un logiciel pouvant s'intégrer dans un environnement d'enseignement à distance et permettant l'évaluation du contenu de copies d'étudiants. Le but d'*Apex* n'est d'ailleurs pas seulement de noter ces copies, mais surtout de mettre à la disposition des étudiants un environnement interactif où ils peuvent écrire, soumettre leur copie à évaluation, puis réviser leur texte selon les indications du logiciel. Le travail de l'enseignant est ici de proposer un cours en ligne, de le hiérarchiser, et de proposer éventuellement des questions d'examen types. La procédure d'évaluation utilise la méthode *Latent Semantic Analysis* (Analyse de

la sémantique latente), un outil permettant de représenter la sémantique des mots à l'aide de vecteurs dans un espace de très grandes dimensions. *Apex* mesure la façon dont une copie rend compte du cours en comparant leurs vecteurs respectifs. Trois types d'évaluation sont proposés à l'étudiant : à propos du contenu, du plan et de la cohérence interparagraphes. Ces évaluations sont plus pertinentes que les corrections des questionnaires à choix multiples actuellement présents dans les environnements d'apprentissage à distance.

Integrating Natural Language Processing Techniques and Graph Analysis for Information Retrieval on the Internet

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Abstract:

When it comes to retrieving information on the Internet applying traditional methods based on simple keyword search is not enough. The context in which a document appears must be taken into account: which other web pages it points to, and which other web pages point to it. Our proposal runs along these lines: to integrate some statistical language processing methods with graph analysis techniques based on the HITS algorithm, in order to adequately model the context of a given search on the World Wide Web.

Bayesian Learning for E-commerce

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Abstract:

As it is the case on physical markets, sellers on the Internet usually do not know precisely the demand functions of their customers. However, on such a digital environment, sellers can implement dynamic pricing algorithms that enable them to experiment various prices in order to maximize their profits. The aim of this paper is to study the optimal pricing problem of a Web-store who does not known the demand functions of his customers. We formulate the decision problem of the seller as a multi-armed bandit problem and we study - via simulations - the price dynamics that can appear when the seller has a bayesian rationality. To avoid the well known computational intractable problems of bayesian multi-armed bandit, we rely on some recent works on dynamic allocation problems. Our simulations exhibit an incomplete learning phenomenon which is mainly due to the path dependency of the seller's optimal strategy.

Keywords: E-Commerce, Dynamic Pricing Algorithms, Uncertainty, Simulations, Bayesian Learning, Multi-armed Bandit.

Implementing alternative learning technology

Lessons from Organisational theory

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Abstract:

The speed and growth of networking technology and the enthusiasm with which pioneers in this area have pursued their ideas has often meant that the difficulties of embedding new, C&IT based methods into change resistant organisations has been overlooked.

The main thrust of this paper is that the implementation of alternative learning technology is little different from any technical change within an organisation and will be seen by most organisational members as threatening and challenging to the status quo. This paper will examine some of the organisational change theories and frameworks which could assist the enthusiasts in preparing tactically for effecting significant shifts in the organisations' perception of the usefulness of computer mediated learning. The paper presents these ideas as the basis for further research and discussion

Separating the chaff from the wheat:

Creating evaluation standards for web-based language training resources

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Abstract:

We present the LingoNet project for creating a 'web-based language lab', a website where resources for web-based language training will be collected and made available for use in foreign language education at the university level. One of the most pressing needs in this connection is to develop guidelines, procedures, and tools for the (summative and formative) evaluation of such resources. An important goal of the LingoNet project is consequently to produce such evaluation guidelines. Metadata markup will be used to ensure that information about the resources, including the results of their evaluation—both summative and formative—will be persistent and thus will be fully available to future users of the resources.

Keywords: Language Learning, Learning Resources Evaluation, New Educational Technology, System Design, Web Based Learning.

Using Knowledge and Know-how to Discriminate between Presence and Distant Teaching

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Abstract:

his paper relates a real-size experiment about implementing a Web-based degree of the masters level in computer science. Using the Web as both a library and a classroom is a logical way to set up distant learning, especially when the target student population is connected at office as well as at home to Internet facilities. We chose to sort the assets of our problem in order to answer this first question: Is the teaching of computer science adapted to total distant learning? So we created a degree from scratch , picked up an experimental group of 15 students spread in three categories (professional, students in other degrees, plain students), implemented and delivered the most sensitive courses (those that mingled knowledge and know-how). Asked about the three crucial items about which we needed information, i.e. Knowlege' (distance) vs 'Know-how' (presence), document format, and distant tutoring via e-mail, the students applauded at the splitting we chose between attendance and sole e-learning, definitely preferred multiple formats, and seemed to prefer face-to-face questions and relationships.

Keywords: Web based learning, distant learning, distant graduation, computer science teaching, education-oriented WEB architecture.

Learning Sequence Controlled by Learners and Educators, within a CBI System

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Abstract:

This paper explores the validity of learner-controlled learning sequence within the context of CBI. The authors analyse the issue from the framework provided by the implementation of the Technology-mediated Adaptive Learning (TAL) model. The TAL model was built based on constructivism and places an especial emphasis on learner control. During the implementation stage, it was revealed that a shared control between the learner and the educator could be a more plausible approach. The main points of concern about relishing total control of the learning sequence to learners are: the danger of discrediting the educators' professional responsibilities towards learners, framing learners under a static learning styles, inefficient use of both human and physical resources, and alienating the learner from the learning environment. This paper addresses these points of concern and provides guidelines for their implementation within CBI.

Keywords: Computer-based Instruction (CBI), Technology-mediated Adaptive Learning (TAL) Model, Constructivism, Learning Sequence, Linear and Non-linear Learners, Learner Control.

Metric on decision trees and optimal partition problem

Critère pour la segmentation et problème de partition optimale

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Abstract:

In designing a decision tree for classification, the Kolmogorov-Smirnov distance has been introduced by Freidman as a criterion for constructing binary trees. An efficient procedure which integrates a binary decision tree is presented. The nonparametric approach is based on the extension on the Kolmogorov-Smirnov criterion for qualitative variables which yields an optimal classification decision at each node. Our purpose is to adapt the Kolmogorov-Smirnov to a range with categorical variables and an arbitrary number of classes, and to reduce the computational complexity of the partitioning algorithm for finding the optimal partition.

Résumé :

Dans les méthodes de segmentation par arbre de décision, la distance de Kolmogorov-Smirnov est introduite par Friedman comme un critère pour la construction des arbres binaires. L'approche non paramétrique est basée sur l'extension de la distance de Kolmogorov-Smirnov aux variables qualitatives. Notre contribution est la généralisation de cette distance au cas multiclasses et plusieurs variables qualitatives ; la seconde étape est consacrée aux problèmes d'optimisations soulevés par cette nouvelle métrique.

Keywords: Segmentation, classification, decision trees, Kolmogorov-Smirnov.

Learner experiences of web-based learning

Discussion Session animated by

John Rosbottom

University of Portsmouth - Department of Information Systems

Abstract:

This conference session is planned as a genuine *discussion,* to be introduced by John Rosbottom who will give a short presentation based on a two year study of on-line learners throughout Southern England. A description of the learning environment and the quantitative and qualitative results observed will be used to facilitate a discussion among the participants on the strengths and weaknesses of this kind of learning. Participants should be prepared to share any case studies in their own experience.

Unsupervized Machine Learning from WWW logs : a Case Study on Association Rule Mining

Conference animated by

Jean-François Boulicaut

Institut National des Sciences Appliquées de Lyon - France

Abstract:

Intranets have become powerful and complex devices in nowadays Information Systems. Their administrators are in duty to maintain and improve Intranet structure and content, in order to upgrade it. Applying Data Mining techniques may provide administrators accurate knowledge about Intranet use as well as users themselves. This knowledge may help to achieve mentioned tasks. We present the use of an unsupervized learning technique, the so-called association rule mining technique, in order to provide a useful summarization of Intranet logs. An example of such a rule might be « When a user has visited URL 12 and URL 34 within a session, then he generally visits URL 72 too ». In our invited talk, we point out the major difficulties of such processes (i.e., log preprocessing, frequent itemset mining, and association rule post-processing) and outline some of the solutions designed in our research group [BO et al 00ab].

Keywords: Web Usage Mining, Association Rule Mining.