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Generation of adaptive content by using learning styles

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ABSTRACT

We try in this poster to present a state of the art about the different adaptive hypermedia systems proposed in the literature. The aim of this state of art is to clarify optimization problem in such systems.

Keywords: Adaptive hypermedia, learner model, Adaptation, Learning Styles, Optimization.

1. Introduction

Hypermedia systems offer a set of paths for each learner to choose his path among the data . They are designed to promote acquisition of knowledge and provide a set of documents in the form of nodes (text, images, sounds, animations) connected by links .

Adaptive hypermedia systems have the ability to change their characteristics according to their perception of goals, personal characteristics, preferences and knowledge of the learner. Thus, adaptive hypermedia systems are designed to align the content of hypermedia document and user profiles. They use for this purpose, one or more models to represent knowledge and one or more adaptation strategies.

The objective of adaptation is to provide the user at any time, relevant information presented in an appropriate manner [1]. In hypermedia applications, many adaptations can be found for a single learner. In this sense, the most appropriate information means the information that best adapted for a learner.

2. State o art

Different adaptive hypermedia systems proposed in the literature are presented in this section. Most of these systems operate in their various models of knowledge architectures to provide learning and teaching techniques customized. In [2] the authors show that the general architecture of most adaptive hypermedia systems boils down to: a student model, a model of content and a coping strategy [3]. In this poster, we presented adaptive hypermedia systems proposed in the literature according the two previous models(learner model and content model).

2. 1 Learner model

In the context of human learning, the basic principle is implemented to estimate the learner needs to adapt the content of hypermedia document. The learner model can be divided into knowledge model and preference .

The knowledge model of the learner contains information about the level of knowledge of the learner in relation to each concept considered in the conceptual model of content.

The preference model contains information that describes characteristics other than the level of knowledge. The data can be found are age, language ability and information about the equipment he uses as the flow of its internet connection. In this case, data is often stored as attribute-value pairs. These data are considered as the set of preferences of a learner. They are obtained by an agent who observes the behavior of the learner in its activity. However, questions arise: How to measure the values of attributes of the user model? And when to perform this measurement?

Authors oh hypermedia application consider several solutions, such as seizure explicit early in the session by the user of some attributes about it (ex: background knowledge) or an indirect input data to define their learning style by through a questionnaire as does the INSPIRE system.

The system Heritage Alive Learning System also exploit the style of learning to adapt the information to the learner. They use the model of Felder and Silverman which contains four dimensions (sensing / intuitive, visual / verbal, sequential / global, active / reflective).

BAG (Style-based Ant Colony System) is another system that uses four methods of collection of learners (visual, auditory, reading / writing, kinesthetic). The system is based on the model of learning style of VARK to find a course suitable for learners using ant colonies. Identification of learning styles is done with the questionnaire VARK. Furthermore, learners can voluntarily express their learning styles [4].

2. 2 Content model

The content model of adaptive hypermedia systems is composed of a set of elements that represent fragments of elementary knowledge of the area studied .

The FTAA has a system of hierarchical content model consists of concepts which the authors associate the following types: Text, Programming scheme, Exercise, Test. Each concept is then decomposed into elementary fragments (Text, Exercise definition, hint Exercise, Exercise solution, Source Code).

The framework MEDEA consists of a model contained organized in the form of a network of semantic knowledge. From a conceptual point of view, MEDEA is defined by a semantic network of concepts and education material aimed at assisting the teaching of concepts

The authors have designed the content model of the system DCG (Dynamic Course Generation) based on the hierarchical model.

INSPIRE system (Intelligent System for Personalized Instruction in a Remote Environment) exploits this structure to model its content. This is an adaptive hypermedia system of education. Its objective is to make the learner master of his learning path. The content model of the system is based on the notion of learning objectives that the learner is allowed to choose to begin his study. [4]

3. CONCLUSIONS

The research in the field of adaptive hypermedia systems is progressing in the direction of improving the adaptation criterion based on the learning style.

However, adaptive hypermedia systems based on learning styles can't guarantee that adaptation provided the learner is an adaptation of the most suitable for him. So the question remains still arises in this field: *Is that adaptation provided the learner is the most optimized adaptation for him? How to optimize adaptation and provided to learners*?

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