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STUDENT MODELLING AND ADAPTIVITY IN WEB-BASED LEARNING SYSTEMS

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Binglan Han

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Abstract

Web-based educational systems are now becoming part of main stream education. As an essential component of the web based educational systems, the student model enables the system to provide individualised course contents and study guidance, and therefore to help the students with different backgrounds and knowledge levels to achieve their learning goals effectively on the web.

A prototype student model was developed in this project for a web based learning system. The architecture of student model is divided in two parts: individual and group student models. The information contained in individual student model includes the student knowledge levels for course contents, study goals, learning styles, preferences, etc. The individual student model is initialised by asking students their behavioural preferences through a questionnaire, and using default information based on stereotyping in the group student model. The model is updated dynamically according to student study times and/or assessment results. The group student model is extracted by a cumulative analysis of the individual student models of various students and is used for giving guidance to the students. Both navigation and content adaptations are provided based on the information maintained in student models.

A web-based educational system was constructed for implementing and testing the student model. The web-based system adopted a three-tier, client-server architecture. The first tier is a set of HTML frames embedded with Java Applets running in the student's web browser to provide course contents and navigation guides. The middle tier consists of Java Servlets, JSP, and application programs to receive student requests, update student model, and send adaptive course contents and navigation guidance information to the client side. The course contents are stored in XML files that are processed to create the individualised course content presentations. The third tier is the relational database for storing the course structures and contents, and the information in the student model.

This study produced a unique two-fold web-based student modelling system that can be applied to intelligently deliver the courses for a wide range of subject domains.

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