

Design of an automatic answering tool for e-learning environment

Mohamed JEMNI

Ecole Supérieure des Sciences et Techniques de Tunis

5, Av. Taha Hussein, B.P. 56, Bab Mnara 1008, Tunis, TUNISIA

e-mail : Mohamed.Jemni@fst.rnu.tn

This work constitutes a new component to be incorporated in e-learning environments in order to answer automatically students by using and exploiting past cumulated experiences in past e-learning sessions. For instance, this tool will be added to the system we are developing since several years and we called it PERSO. The main objectives of PERSO is to introduce intelligence into e-learning environments and to automate a set of its features (e-mail return, student profile determination, dynamic course generation, online assessment of student and generation of course material at the student level,...)

This paper is organized into two parts: the first one is dedicated to present the global project PERSO. The second is devoted to the automatic answering tool.

1. The PERSO project: the goal of PERSO is to design and develop an adaptive hypermedia e-learning system, where learners with different learning goals and different learning aptitudes are treated differently, by building a model of knowledge and preferences about each of them. This model is used to propose automatically for each learner a personalized course fitting with his needs.

PERSO is mainly based on the elaboration of dynamic questionnaire generator to model the student background about the subject to be taught. We use an open approach where student expresses his answer to the system question on free verbal statements. The system performs an analysis of the student's answer by calculating its semantic closeness to the correct answer stored in the system by the professor. The semantic closeness is calculated by use of a powerful technique named Latent Semantic Analysis.

On the other hand, PERSO is based on a course generator. The user model built by the questionnaire is used to generate automatically, for every student, an appropriate training content. To build a new course, PERSO tries to exploit previous experimentations and solutions when creating a new personalized course by the use of a case based reasoning approach.

2. The automatic answering tool: our aim by this tool is to reduce professors work load and to give an immediate answer to the student - when it is possible - by exploiting the cumulative experiences from past students for the benefit of new ones. In particular, it's known that in every learning session of a given course, students may ask the same questions and tutors (who may be different) may answer the same answers. In this context, our approach consists on saving questions/answers (with the permission of the professor/tutor) in a data base, and when a question is mailed to the tutor, the tool tries to search for this question in the data base, if found, the system answers automatically the student by giving him the stored answer otherwise the question will be submitted to the tutor. A key step of our approach consists on the semantic analysis of questions and the technique we use to store them in the data base. In the extended paper we will present the architecture of this tool and techniques and approaches we use to analyse questions, to supply and to exploit the questions/answers data base.

References

E. Aïmeur, G. Brassard, H. Dufort & S. Gams, CLARISSE: A Machine Learning Tool to Initialize Student Models, ITS-02, Sixth International Conference on Intelligent Tutoring Systems, pp. 718-728, Biarritz, France, June 2002.

I. Arroyo, R. Conejo, E. Guzman & B.P Woolf, An Adaptive Web-Based Component for Cognitive Ability Estimation, in Proceedings of the 10th International Conference on Artificial Intelligence in Education, pp. 456–466, San Antonio, Texas, May 19-23 2001.

D. Billsus & M. Pazzani, Learning and Revising User Profiles: The Identification of Interesting Web Sites, *Machine Learning* 27, 313–331 (1997) Kluwer Academic Publishers.

H. Chorfi & M. Jemni, PERSO : Towards an adaptive e-learning system, to appear in the “Journal of Interactive Learning Research, Special Issue on Computational Intelligence in Web-based Education” 2004.

H. Chorfi & M. Jemni, PERSO: A System to customize e-training, 5th International Conference on New Educational Environments, May 26-28 2003, Lucerne, Switzerland.

P. Cotter & B. Smyth, Wapping the Web - A Case Study in Content Personalisation for WAP-Enabled Devices, In Proceedings of the International Conference on Adaptive Hypermedia and Adaptive Web-based Systems, Trento, Italy, August 2000.

J. Kay, Stereotypes, Students Models and Scrutability, in Gauthier, G., Frasson, C. and VanLehn, K (eds) Intelligent Tutoring Systems ITS 2000, Montréal, Canada, Berlin: Springer-Verlag, pp. 19–30, 2000.

Landauer, T.K., Foltz, P., & Laham, D. “Introduction to Latent Semantic Analysis”. *Discourse Processes*, 25, pp. 259-284, 1998.

N.K. Person, A.C. Graesser, L. Bautista & al, Evaluating student learning gains in two versions of AutoTutor. In J.D. Moore, C.L. Redfield and W.L. Johnson (Eds.) *Artificial Intelligence in Education: AI-ED in the Wired and Wireless Future* (pp. 286-293). Amsterdam: OIS Press, 2001.