Artificial Intelligence in Education V. Dimitrova et al. (Eds.) IOS Press, 2009 © 2009 The authors and IOS Press. All rights reserved. doi:10.3233/978-1-60750-028-5-802

AutoTutor Lite

Xiangen HU^{*a*1}, Zhiqiang CAI^{*a*}, Lu HAN^{*a*}, Scotty D. CRAIG^{*a*}, Tianjiang WANG^{*b*}, and Arthur C. GRAESSER^{*a*}

^a The University of Memphis ^b Huazhong University of Science and Technology, Wuhan, Hubei, P.R. China

The AutoTutor Lite system is based on AutoTutor[1], an intelligent tutoring system shown to be effective in empirical tests. One challenge of AutoTutor is its scalability due to its dependence on the language analyzers. AutoTutor Lite presented here is a minimalist implementation of AutoTutor. It only includes an AutoTutor style interface and interaction with a lightweight language analyzer.

Similar to AutoTutor, AutoTutor Lite interacts with students using natural language and is most effective when the learning objectives are qualitative/conceptual. AutoTutor Lite requires users to construct an answer to a question. A typical system interaction starts with a general seed question. The system evaluates the student's answer and asks follow-up questions, which it selects based on the student model.

The lightweight language analyzer implemented in AutoTutor Lite is used to create the simple student model, called Learner's Characteristics Curves (LCC). There are four curves collectively describing what students "know" about the expected answer to the seed question. The four curves are measures of students' input in four different indices: relevant-new, relevant-old, irrelevant-new, and irrelevant-old.

- Relevant-new: Relevant to the answer and not included in the previous answers
- Irrelevant-new: Irrelevant to the answer and not included in the previous answers
- Relevant-old: Relevant to the answer, but was included in a previous answer
- Irrelevant-old: Irrelevant to the answer and included in the previous answers The four measures are computed from a lightweight language-analyzer. AutoTutor

Lite provides feedback and selects the next questions based on these four indices. LCC is a simplification of the student's model in comparison to other sophisticated ITS implementations. LCC is enough for the tutor to offer appropriate feedback and question selection. For example, a non-decreasing trend in Relevant-new could indicate active construction of answers, while positive values of Irrelevant-new indicate knowledge deficits for the answers. The quality of LCC is dependent on the quality of the language analyzer implemented. The current implementation of AutoTutor Lite uses extended weighted keyword matching and latent semantic analysis.

The working URL for the demonstration is <u>http://www.autotutor.org/ATLite/</u>.

This event will require an Internet connection.

Reference

A.C. Graesser, P. Chipman, B.C. Haynes, & A. Olney, AutoTutor: An intelligent tutoring system with mixed-initiative dialogue, *IEEE Transactions in Education* 48 (2005), 612–618.

¹ Corresponding Author: Xiangen Hu, Department of Psychology, The University of Memphis, Memphis, TN 38152