GnuTutor: An open source intelligent tutoring system (Interactive Event) [1]

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AutoTutor is a system developed at the University of Memphis that simulates a human tutor by holding a conversation in natural language [1,3]. AutoTutor's dialogue and pedagogical strategies are modeled on those of human tutors observed by Graesser, Person, and colleagues at the Institute for Intelligent Systems [2]. AutoTutor produces learning gains of approximately .8 sigma (almost a letter grade) greater than read-textbook controls [1].

Over the past ten years, versions of AutoTutor have been created to run on the desktop, in a web browser, and on distributed machines running the .NET framework. As the capability of AutoTutor has grown, so have requests to use its code base for educational purposes in elementary schools, high schools, and universities. To faciliate the dissemination of AutoTutor technology, we have created GnuTutor, an open source reimagining of AutoTutor.

GnuTutor preserves much of the original functionality of AutoTutor as described in [3], including mixed initiative dialogue, speech act classification, an animated agent, and natural language understanding using latent semantic analysis. However significant effort has been made to simplify the codebase, making GnuTutor appropriate for both the teaching of intelligent tutoring systems as well as a starting point for derivative ITS. The greatest simplifications are in the dialogue manager, which has been reimplemented in just two hundred lines of Prolog. GnuTutor is hosted on Sourceforge and is cross-platform under the Mono and .NET runtimes. It is the first open source, conversational intelligent tutoring system.

References

[1] Arthur C. Graesser, Andrew M. Olney, Brian C. Haynes, and Patrick Chipman. AutoTutor: A cognitive system that simulates a tutor that facilitiates learning through mixed-initiaive dialogue. In C. Forsythe, M. L. Bernard, and T. E. Goldsmith, editors, *Cognitive Systems: Human Cognitive Models in Systems Design*. Erlbaum, Mahwah, NJ, 2005.

[2] Arthur C. Graesser, Natalie K. Person, and Joseph P. Magliano. Collaborative dialogue patterns in naturalistic one-to-one tutoring. *Applied Cognitive Psychology*, 9:1–28, 1995.

[3] Andrew M. Olney, Natalie K. Person, Max Louwerse, and Arthur C. Graesser. AutoTutor: A conversational tutoring environment. In *Proceedings of the ACL-02 Demonstration Session*, pages 108–109, Philadelphia, 2002. Association for Computational Linguistics.

[1] A demonstration and source code are available at http://gnututor.com.

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