Medical Xpress

Computer model can predict human behavior and learning

November 7 2008

A computer model that can predict how people will complete a controlled task and how the knowledge needed to complete that task develops over time is the product of a group of researchers, led by a professor from Penn State's College of Information Sciences and Technology.

Frank Ritter, associate professor of IST and psychology, and his research associates, used the Soar programming language, which is designed to represent human knowledge, on a 20-trial circuit troubleshooting task most recently done by 10 students at the University of Nottingham, UK.

Each participant was to identify faults in a circuit system after memorizing the organization of its components and switches. This process was repeated 20 times for each person, with the series of tests chosen randomly each time. Their choices and reaction times were recorded and compared with the computer model's results.

Much like the students, the computer model, called Diag, learned as it went through each test and developed the knowledge for completing the task quickly and efficiently.

"The model does not merely accurately predict problem-solving time for the human participants; it also replicates the strategy that human participants use, and it learns at the same rate at which the participants learn," Ritter said.

In most cases, the model came within two to four seconds of predicting how long it would take each participant to solve the problem and it fit eight out of the 10 participants' problem-solving times very well. Ritter said the results outlined in the paper were consistent with previous trials, showing the development of regularity in the model.

"The project shows we can predict human learning on a fine-grained level," Ritter said. "Everyone thinks that's possible, but here's an actual model doing it. The model provides a detailed representation of how a transfer works, and that transfer process is really what education is about."

Ritter worked with Peter Bibby and two research assistants at the University of Nottingham. Their paper, "Modeling How, When, and What is Learned in a Simple Fault-Finding Task," appeared in the July/August 2008 issue of *Cognitive Science*.

Source: Penn State

Citation: Computer model can predict human behavior and learning (2008, November 7) retrieved 28 April 2024 from https://medicalxpress.com/news/2008-11-human-behavior.html