Conference Participation Report: ITS 2004, Maceio Brazil

Pramuditha Suraweera

The 7th International Conference in Intelligent Tutoring Systems (ITS 2004) was held at the Ritz Lagoa de Anta Hotel in Maceio, a small costal town in the east of Brazil. The conference focused on a wide range of topics related to ITS issues including, student modelling, collaborative learning, authoring systems and tutorial dialog systems.

The conference presented a total of 73 papers and 39 posters. While the papers were presented in three parallel sessions, the posters were presented in one session beside the pool over cocktails. The acceptance rate for conference papers was 39% with papers being submitted from all over the world. The conference also held a separate session for PhD students named the "Young researchers track", which included 9 presentations.

1 Keynote Presentations

Bill Clancey from NASA, USA presented ways in which ITSs can assist in human-robot exploration of space. Some opportunities outlined included adapting student modelling to the problem of instructing robots, providing astronauts with training and multi-agent systems using natural language for surface exploration. The presentation included a short video of NASA astronauts using a prototype of a multi-agent system using natural language for exploring surface geometry.

Elliot Soloway and Cathleen Norris presented their work in using digital resources inside of schools. They argued that traditional teaching methods are inefficient and that they need to be upgraded with the use of digital technology such as hand-held devices. Elliot argued that hand-held devices were an economically feasible option due to their low cost and encouraged the ITS community to endorse these devices and build ITSs that can run on PDAs with small displays. The presentation included details of their efforts to introduce a PDA with educational software to every student in the classroom.

Riichiro Mizoguchi's keynote speech on Ontological engineering was initiated by an introductory discussion on ontologies, ontological engineering, how it is different from knowledge engineering and benefits of ontologies to ITSs. The latter part of the speech included details of ontology aware systems and the use of ontological engineering for systemising knowledge.

2 Papers

Although most of the papers at the conference were interesting, there were very few papers that were directly relevant to my research. The papers by published by K. Koedinger et al. and M. Jarvis et al were the most relevant.

Ken Koedinger's paper on a set of authoring tools that allows the creation of "Pseudo Tutors" included a demonstration to create such tutors and results of a preliminary evaluation. "Pseudo Tutors" while demonstrating the behaviour of cognitive tutors based on the ACT-R theory contain a domain model that is specific to the set of demonstrated problems. CTAT, a tool for authoring these tutors, provides domain experts with an interface builder and a problem solving process recorder. It records the problem solving steps demonstrated by the domain expert in terms of behaviour graph. The domain expert has to annotate the behaviour graph with hint and feedback

messages. The author is required to demonstrate correct and incorrect solution to each problem and CTAT would generate a “Pseudo Tutor” capable of presenting the demonstrated problems to a student.

The paper included details of a preliminary evaluation on the time spent on developing these tutors. The preliminary evaluations estimated an average development time to instruction time ratio of about 200:1 for a complete cognitive tutor and a ratio of 23:1 for “Pseudo tutors”. The presenter argued that the ratio was very much in favour of “Pseudo tutors” and that building such tutors require less knowledge engineering expertise. While the presenter pointed out the limitations of the flexibility of these tutors he also said that the impact of this restrictiveness on the student has to be formally evaluated.

Neil Heffernan presented a paper on applying machine learning techniques to rule generation for ITS. Their work focused on learning ACT-R rules by analysing multiple examples. Their rule generation system was embedded in the CTAT system presented by Koedinger. The system would use the behaviour graph produced by the “Pseudo tutor” builder and generalise it. The generalisation is carried out by an exhaustive search algorithm that tries out the functions provided by the domain expert.

The presentation also included details of a few experiments performed to evaluate the effectiveness of the rule learning system. The results showed that the system produced the rules required for the domains of multiplication, fraction addition and tic-tac-toe in reasonable time.

3 My Presentations

I presented three papers at the conference: a paper at the young researchers track session, a paper at the ontology workshop and a paper at the conference. The young researchers track (YRT) had very poor attendance consisting of only the presenters as other workshops ran parallel to it. My presentation went well but due to the size of the audience and the as they were from different disciplines within in ITS, there were very few interesting questions.

The presentation at the ontology workshop on the use of ontologies for authoring domain knowledge went very well. Unlike the YRT session, the audience consisted of numerous experts interested in ontologies in ITS. The presentation was received well and some interesting questions were raised.

The conference paper presentation also went very well. Many questions were raised at the end of the presentation and my answers were well received. Ken Koedinger and Neil Heffernan talked to me afterwards about my research.

4 Summary

The conference offered me a great opportunity to interact with prestigious researchers in the area of ITS from all over the world. It provided me with an opportunity to learn about other cutting edge research in the area which assisted me to come up with a few new ideas relevant for my research. All in all the conference was an extreme success.

I would like to thank the Computer Science and Software Engineering department for providing the funds that allowed me to travel to Brazil and present my papers.