

**School of Computer Science  
M.S. Thesis Defense**

**By  
Andrew Hulsizer**

**Teaching Recursion through Interactive Media**

**ABSTRACT**

Games are widely used to motivate and aid students in learning. Temple Treasure is a computer based game that allows students to learn a challenging computer science topic (recursion via depth first traversal in binary trees). Temple Treasure is designed to provide both cognitive and affective gains for students. Participants were chosen from a data structures class containing predominantly computer science majors and minors and computer engineering majors where depth first traversal in binary trees was taught. Students in this class had prior exposure to recursive ideas like mathematical induction from a prerequisite course. Participants took a pretest, played Temple Treasure and took a posttest. Both tests measured the participant's ability to use recursion successfully and their confidence in doing so. The cognitive gain was measured by comparing the posttest and pretest scores. In addition to the cognitive gain, students were asked about their attitudes towards the use of video games in education and the classroom. The results achieved showed both a positive response to the game and a statistically significant increase in test scores. Not surprisingly, the student's responses showed that the participants like the idea of using games in class as homework or a lab. It is more surprising that students who have already studied recursion through traditional means (lecture, homework, projects) were able to improve their performance from a short exposure to a video game. This shows the potential to use video games to meet high level learning objectives (analysis, evaluation, synthesis) [1].

**Date: Friday, June 24, 2011**

**Time: 8:00 a.m.**

**Place: Devon Energy Hall, room 151**

**Committee members: Dr. Deborah Trytten – Chair  
Dr. Rex Page  
Dr. Jean Cate**

**Reading Copy available in Computer Science Graduate Assistant's office DEH 105**

*For accommodations on the basis of disability, please call 325-4042.*