
PROPOSAL TO RESEARCH VISUALIZATION OF DECISION- THEORETIC PLANS

BRIAN OPPENHEIM - BS/MS STUDENT, COMPUTER SCIENCE
DR. ALEXANDER DEKHTYAR - ASSOCIATE PROFESSOR, COMPUTER SCIENCE
CALIFORNIA POLYTECHNIC STATE UNIVSEITY, SAN LUIS OBISPO
HNRS-200 - WINTER QUARTER 2008

PROBLEM

Human beings are constantly looking for advice in situations where decisions are complex and include a vast array of possible choices and outcomes. Current probabilistic decision making software programs have made great strides in terms of their ability to make quick, mathematically precise decisions. They however, have failed to communicate these scenarios effectively with users who are not familiar with statistical theory. This communication gap makes it difficult, if not impossible, for users to gain any benefit from the information presented by the software.

In this project, the primary domain of research will mostly be limited to developing interactive plans for advising settings. These domains include academic advising and advising of welfare to work program clients. Both problem sets would greatly benefit from having a software program to compliment advisors with large case loads. While these subjects are the main problem to be solved with this research, there is a broader, secondary goal to learn about how humans visualize and understand decision making scenarios through the use of technology.

BACKGROUND

This project is a continuation of research and programming efforts made by a group of students and Professors from the University of Kentucky. Their previous efforts have led to the development of a software suite called *PlanIt*. This software's function is to interact with the user to show them how various actions will likely affect the outcome of some process. It has been written so that the decision making algorithm can be switched in and out to allow independent development of the prediction logic and the interface presented to the user. The current user interface was tested using freshman computer science students at the University of Kentucky. The overwhelming response was that it did not provide an intuitive experience. Thus, the researchers involved have decided to put more effort into developing a new interface for interacting with users.

METHOD

This project will use four main processes. The first method, qualitative analysis, will be used to identify the weaknesses of the current system. Secondly, brainstorming and research into human cognition of decision making will be used to design revisions to the current software. Thirdly, we will use programming to take our design concepts and put them into the program. Finally, we will use a study to assess the quality of the software that we have designed.

PLAN

Following closely with the four methodologies discussed in the previous section, the plan will largely involve four steps. First, the research team will spend a week or so evaluating the current software suite. The deliverable for this step will be the first written evaluation compiled of the *PlanIt* software. Next, the research team will begin to research and discuss how humans visualize and think about decision making scenarios. This analysis will then help the team to re-design the *PlanIt* user interface. The research team will then enter the third step of the process, implementing the re-design of the software in Java programming code. After the new design has been implemented and thoroughly tested, the team will move to the final step. In this step, a sample group of volunteer students will be asked to use the software. Afterwards, they will evaluate their experience and help the team adjust the interface to make it more intuitive.

Throughout the process the team will document their methods and findings. This information will ultimately be compiled into a scholarly paper. The eventual goal for this work is submittal to scholarly journals and submittal to conferences in the fields of decision making and computer science.

MY ROLE

My specific role in the project has not been well defined as of the date of this proposal in terms of specific duties and hard deliverables. Working closely with the other members of the research team, the work on the project will be divided up and assigned dynamically as the project progresses. I will however have some duties in each of the four steps I have described. In the first task, I am working with another Computer Science student who is on the project to develop the written list of specific things that we feel need to be improved in the software.