

title	Visualization of Decision-Theoretic plans
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department	Computer Science
proj_desc	<p>Planning is a commonplace human activity, which is typically abstracted in terms of choosing sequences of actions that lead to a specific goal, or maximize certain rewards.</p> <p>Decision-theoretic planning is a subarea of artificial intelligence that has as its goal building software for planning in different domains.</p> <p>In simple domains, planning is deterministic: the exact effects of all actions are known in advance. However, most real domains in which decision-theoretic planning is desired have actions whose exact effects cannot be predicted in advance. For example, it is the role of an academic advisor to suggest courses for students that best fit their goal of obtaining a specific degree (or receiving a specific education). However, an action of take a course does not have a deterministic effect: students may pass the course with various degree of achievement (A, B ,C), they may fail the course, or withdraw from the course completely. When long-term plans are made in domains such as academic advising, the likelihood of specific outcomes of actions also needs to be taken into account.</p> <p>This leads to a new formal notion of a plan (or policy), and a drastically new approach to building and evaluating plans. Methodology for building good decision-theoretic plans in the presence of uncertainty exists and is well-studied, however, the problem of presenting computed plans to end-users is not.</p> <p>The proposed project will concentrate on building software for presenting decision-theoretic plans to their consumers. We will use academic advising as a sample domain , and Cal Poly students as consumers. The goals of the multi-disciplinary team working on the project will be to:</p> <ul style="list-style-type: none"> (a) learn and understand the notion of a decision-theoretic plan; (b) develop a student's cognitive model of a decision-theoretic plan in the academic advising domain (this stage may potentially involve a number of experimental studies to assess how Cal Poly students evaluate academic plans); (c) design and implement software for display of decision-theoretic plans that incorporates the developed cognitive model; (e) evaluate the utility of the implemented software.
inter_desc	<p>The project is designed to be a collaborative effort between computer science/mathematics/statistics students and students studying psychology, cognitive and behavioral sciences. The psychology/cog.sci students will take lead in designing the experiments and building the cognitive model of advising plans and communicating this model to the students the CS/Math/Statistics students. They will also conduct usability testing of the developed software. The CS/Math/Sats students will design the plan presentation software and implement it, as well as participate in other activities within the project.</p> <p>While the final deliverable of the project is a software product, the success of the project depends highly on the successful collaboration between two sides.</p> <p>An ideal project team will involve 3-4 students, and will include at least one computer science student and at least one student in psychology/cognitive/behavioral science.</p> <p>The project in particular is intended for Computer Science students interested in artificial intelligence and human-computer interaction; psychology students interested in cognition and information; math and statistics students interested in the applications of probabilistic methodologies.</p>
links	
students	3

majors	CSC, MATH, STAT, PSY, EDUC
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