

Conference explores software's social implications

Galen Gruman, Soft News Editor

Policy makers have turned increasingly to using computer models to address political questions, although they do not always use them as scientists might expect, said Judith Perrolle, a sociology professor at Northeastern University. She spoke at the Directions and Implications of Advanced Computing Conference, held July 27 in Boston, sponsored by the Computer Professionals for Social Responsibility. The wide-ranging conference drew about 75 people.

Models. "Models are used to legitimize [existing] policy agendas," she said — but not always to change them, as scientists might expect. Perrolle leads a project to study how such models affect policy on global warming in Africa and Asia.

Preliminary results show that models serve as an equalizer in negotiations. For example, models give negotiators a way to compromise. "It's much more politically acceptable to back down in the face of 'scientific truth,'" she said, "Models act as a surrogate for scientific truth."

To be effective, models need not be accurate, Perrolle said. For example, the nuclear-winter scenarios of the early 1980s and the population-explosion predictions of the 1960s were based on flawed models, but they raised concerns that affected international policy on nuclear war and population growth. "This is part of the process," she said, "Maybe you get behavior changed and invalidate the models."

Scientists should be aware the politicians will use models to serve their own ends, like being reelected or feeding the hungry, and not necessarily use them as the scientists might intend. For politicians, "it's a question of multiple values and multiple priorities," Perrolle said, "The models and modelers contribute to the scientific debate, [but] scientists should be aware of its uses and abuses."

Who decides? A theme in several presentations was if and when people should cede decision making to expert systems

or other computer systems. In a presentation on software to detect fraudulent medical-insurance claims, Sue Stafford, a philosophy professor at Simmons College in Boston, said "there is mounting pressure to use these systems to automate decision making, rather than assist."

While today's systems are "good," Stafford raised several concerns in moving from their use as assistants to decision makers: Not all cases are straightforward, so some legitimate claims will be denied, which will increase the adversity many doctors feel toward insurance companies. Current laws in the US require that

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companies review any denial of claims, but it is not clear whether this includes review by computer.

A more dramatic question of when to let computers decide was presented in a review of the 1988 destruction by a US naval vessel of an Iranian civil airliner. Using public information, Chris Gary, a doctoral candidate in history at the University of California at Santa Cruz, showed that the crew based its decision to fire at the airliner on *mis*interpretation of correct data from the on-board Aegis battle system.

When asked if this meant an automatic system might have prevented the deaths, Gary — a skeptic of AI technology in the military — conceded it might have in this case but said the incident pointed to a potentially worse problem: that people more easily trust decisions based on computer-generated data even when they have other data to contradict their decisions. He also pointed out that the Aegis system is not trusted by many captains be-

cause of flaws (which the Defense Dept. denies). For example, he said, no captain has put it on full automatic because it tends to target clouds and friendly helicopters.

Privacy. Computer-accessible records offer society tremendous benefits by making data accessible quickly and comprehensively, but having such data accessible raises serious concerns about privacy, said Michael Rabin, a professor of computer science at Harvard University and Hebrew University in Jerusalem, "The question is, 'Where is the protection?'"

The issue is not simple because "you have conflicting aims, conflicting purposes," Rabin said. People want their medical records readily accessible for treatment both in the hospital and at a pharmacy, "but we do want to have privacy" from the nonmedical staff about our treatment.

Rabin proposed an architecture for a security system that would confine a user's access to data to only those purposes for which it is maintained yet ensure that the system was flexible enough to ensure that the appropriate data was available easily to each type of user. "Computer technology is not just the problem, since it can be an agent for protection," he said.

Rabin also suggested that property laws governing financial trusts — where a trustee carries out the originator's wishes under prescribed conditions — be used as a model to protect private information. The data's originators — the people it describes — should be able to specify how it is used and by whom, he said.

Virtual reality. "Since the two world wars, we've been hit on the head with the real, and we want a break. People are looking for truth in other ways, said Nicole Stenger, a virtual-reality researcher at the Massachusetts Institute of Technology, at a panel on virtual reality. Virtual reality is a new set of technologies that let people explore and work in 3D simulations that include auditory and tac-

tile feedback to make them seem more real. Among predicted uses are teleoperation, which lets someone control, for example, a deep-sea robot by sending signals via computer and receiving a simulation of the robot's environment — as if the person were in that environment.

Many members of the audience angrily denounced the technology, comparing it to psychedelic drugs and television. They voiced fears that it would especially harm children, since it would let them avoid reality, preventing them from establishing a self-identity. They also decried it as a passive, noncreative activity with the potential for emotional addiction and sensory abuse. Psychologists and sociologists voiced the strongest concerns.

One panelist, Gary Marx, a sociology professor at MIT, said that, despite the name, current technology did not allow virtual reality, especially for tactile feedback. "The goal, as in aircraft simulators, is to generate the cues necessary to the job." He compared virtual reality to novels, TV, and CAD wireframe displays.

The other panelists — Stenger and Wil-

liam Bricken of the University of Washington — concentrated on predictions that this technology would fundamentally alter people's perceptions of reality, although both argued that the technology would bring more good than bad, since it would open new worlds for people to explore and experiment with.

The audience criticized the panelists for being involved in the technology and playing up its entertainment and "mind-expansion" aspects.

Computers in school. In a presentation on the use of computers in school, Hank Bromley, an education professor at the University of Wisconsin at Madison, argued that many schools get computers with no idea of how to use them or, worse, use them to encourage rote learning.

The act of fixing knowledge into a computable representation "fixes that representation in a particularly powerful way ... that threatens to more effectively blot out awareness of alternative representations," Bromley said.

The solution, he said, is that people demand that computers be used effectively — and know what that means.