



BY RICK NELSON, EDITOR-IN-CHIEF

Robots, jobs, and war

Robotics was a focus of attention at National Instruments' NIWeek event in Austin, TX, last month, when presenters discussed the technical capabilities and ethical considerations surrounding robot use. Although the technical issues got most of the attention, it may be the ethical ones that prove to be more difficult. Consider mining accidents.

Six miners died tragically in the 2007 Crandall Canyon Mine disaster. The loss 10 days later of three would-be rescuers compounded the tragedy. Could the use of robots to perform the rescue reconnaissance have averted those three deaths?

At NIWeek, Thomas Bewley, a professor at the University of California—San Diego, described the challenges robots can face. Those small enough to access a collapsed mine tend to be too small to climb over the debris they encounter once inside. That problem is one Bewley and his students are addressing by finding ways to have small robots climb over large obstacles. A robot should roll when possible, he says, but use multifunction mechanisms, including plungers, for example, when necessary.

It would clearly be ethical to have robots search for survivors in collapsed mines, sparing rescue workers the risk. If such robots can reconnoiter collapsed mines, however, they could take over mining itself. Mining is a dangerous job, but is it better than no job at all? In less dangerous occupations, is it ethical to substitute robots for humans?

In a recent article, Gregory Clark, a professor of economics at the University of California—Davis, doesn't discuss the ethics of the situation but rather the consequences of what he takes to be the inevitable (**Reference 1**). Clark writes that the current downturn is a minor blip in technology-driven economic growth, and, he cautions, "The economic problems of the future will not be about growth but about ... the ineluctable increase in the number of people with no marketable skills and technology's role not as the antidote to social conflict, but as its instigator" as machines displace people.

In a keynote address at NIWeek, David Barrett, PhD, director of SCOPE (Senior Capstone Program in Engineering) at Franklin W Olin College of Engineering (Needham, MA), described robots that are or will be taking over human tasks, including mining, industry, construction, and agriculture. It won't just be unskilled workers who might have something to fear. Barrett also described various medical robots, including ones that perform surgery.

What should we do about robots' displacement of people? Clark pic-

tures a dystopia: "We could imagine cities where entire neighborhoods are populated by people on state support. In France, generous welfare has already produced huge suburban housing estates, *les banlieues*, populated with a substantially unemployed and immigrant population, parts of which have periodically burst into violent protest." To support such populations, he says, "you tax the winners—those with the still uniquely human skills and those owning the capital and land—to provide for the losers."

Perhaps the most difficult problem of ethics centers on robots' use in the military. In another recent article (**Reference 2**), James Carroll writes, "When will the unempathetic Americans imagine what it feels like to have a robot monster bolt from the sky—the drones of August—and, in one strike, turn a wedding feast into a funeral?" On the ethics of using robots in warfare, SCOPE's Barrett said that, if we don't do it, our enemies will.

It's inevitable that robots will take on more and more roles. The true ethical question comes into play in how we address the consequences, and so far we have fallen short. We cannot continue turning weddings into funerals and turning middle-class neighborhoods into violent *banlieues* of disaffected, unemployed losers meagerly supported by taxing the winners. **EDN**

REFERENCES

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- 2 Carroll, James, "In search of empathy," *The Boston Globe*, Aug 17, 2009, www.boston.com/bostonglobe/editorial_opinion/oped/articles/2009/08/17/in_search_of_empathy.

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