

RoboRats Revisited

Dr. Robin R. Murphy, Director

As director of the Center for Robot-Assisted Search and Rescue (the people with the robots up at the WTC), I'm getting asked by the media and science journals to comment on the roborats. So, I thought I'd volunteer my assessment.

I think the technology is inappropriate at this time. The studies are very, very premature and the conditions on TV really aren't the same.

First, the rats couldn't have been used in the places where our robots went in the WTC--too hot or risk of gas and so on.

Next, remember, the claim is that the rats give better mobility by researchers who have stated that they are unaware of robots actually being used. The rats have to use the same communications and sensors used by robots. The robots on the pile at the WTC were smaller than a shoe box, so that's about the size of the Big Rat with the backpack. So you have all the same issues and about the same mobility. And the robots go for 7-12 hours and the rat 1 hour.

The study only demonstrated navigation when the controller could see the rat, rather than when the controller had to look through the bouncy camera. It's very hard to drive anything through a complex confined space with self-contained lighting and a camera. Assuming you can get the rat to point its head in the right direction when you want--which was not in the study (as in, what they say to the media and what's been validated may not be the same thing.) So this is a big If.

Plus there's been no reported study of what the rat will do in the presence of a powerful counter-stimuli (all that smelly "food") or what happens when there's a communications dropout. The miniature GPS and comms they keep talking about still doesn't exist, BTW. It's darned difficult to get the equivalent of 4 TV channels of video and control through stories of rubble, so it'll dropout no matter what for some period of time. So from time to time, the rat will be "free." Robots can be programmed to reacquire the signal.

And robots can be sacrificed, I've deliberately driven one off a 3 story drop for a chance to see something below (it survived, BTW). But the study didn't define at what point the rat won't jump.

I also think that it's not just about getting through the rubble, it's what to do when you get there. As an example of what a mechanical robot could do within two years, consider that my research group expects to field a miniature medical sensor next month that we hope will enable the robot to detect whether a victim is alive, but unconscious, and return radio signals reporting vital life signs (some cool tech developed for the Navy). We are also organizing an exploratory project to evaluate what it takes to have the robots carry in and control airbags to shore up a collapsed structure. The challenge is not so much

placing the briefcase-sized airbags into the inevitably dangerous, hard to reach location but rather how to sense an imminent shift in the rubble or secondary collapse, then automatically adapt the amount of air in the bags or move the bag- and do so faster than a human could respond over a radio link.

And robots have a much smaller, easy to keep packed, ready to go logistics footprint ;-)

Robots offer greater short-term and long-term potential benefits than a rat, IMHO.

I'm open for discussion about robots and CRASAR exists to get you the best technology to the field. Even rats-- if they'd really work.

Robin