

Video: Collaborative robots learn as they go

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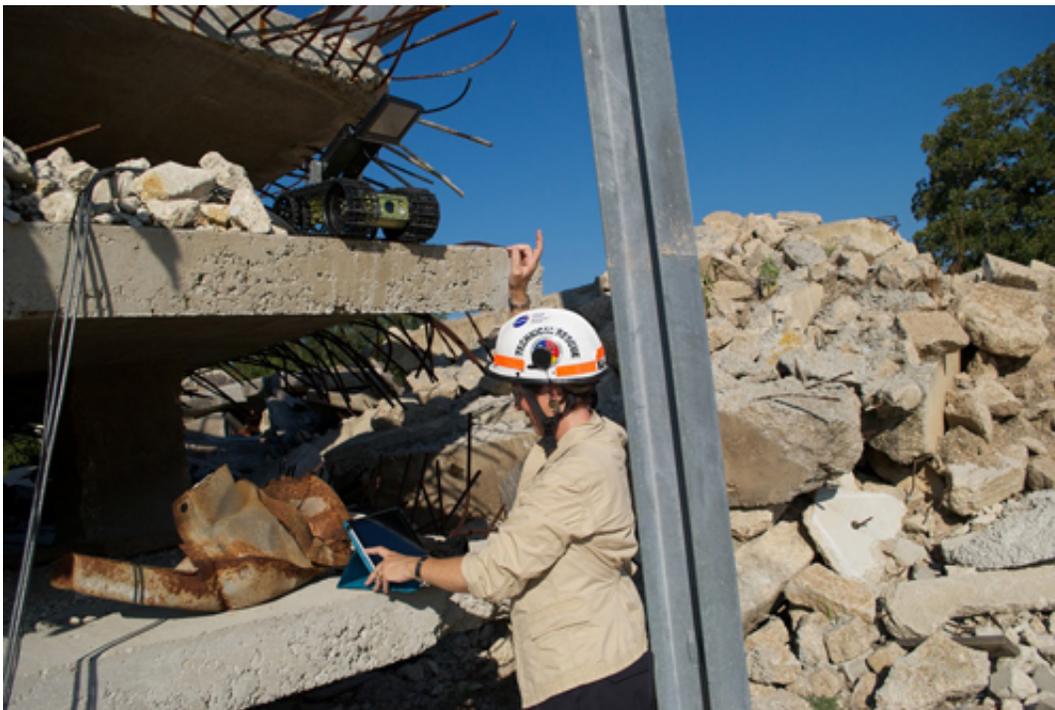


A century after Western explorers first crossed the dangerous landscapes of the Arctic and Antarctic, researchers have successfully deployed a self-guided robot that uses ground-penetrating radar to map deadly crevasses hidden in ice-covered terrains. Deployment of the robot--dubbed Yeti--could make Arctic and Antarctic explorations safer by revealing the potentially dangerous fissures buried beneath ice and snow. Credit: James Lever, U.S. Army's Cold Regions Research and Engineering Laboratory

Meet CoBot—short for "Collaborative Robot." You might call it "help on wheels." With support from the National Science Foundation (NSF), computer scientist Manuela Veloso and her team at Carnegie Mellon University (CMU) are developing CoBots, autonomous indoor service robots to interact with people and provide help "on the go."

Getting on a CoBot's dance card is simple: log on to a website, select a task, book a time slot—and CoBot is on the job. If one CoBot is too busy, then another will carry out the request. CoBots can transport objects, deliver messages, escort people and go to places, continuously executing these tasks over multiple weeks in a multi-floor building. The robustness of the [mobile robot](#)'s localization and navigation has permitted it to travel non-accompanied for hundreds of kilometers in a building.

CoBots are able to plan their paths and smoothly navigate autonomously. They monitor the walls, calculate planar surfaces, and plot window and door locations—all while avoiding dynamic obstacles and even making notes about things like where the carpet and hardwood floor meet. Aware of their limitations, CoBots also proactively ask for help from the web or from humans for locations and for assistance with tasks that they cannot do, such as pressing elevator buttons and picking up objects to be carried.



Clifford I. Nass, the Thomas M. Storke Professor at Stanford University, and Robin Murphy, the director of the Center for Robot-Assisted Search and Rescue and a professor of computer science and engineering at Texas A&M University, are exploring ways to make rescue robots more user-friendly by incorporating lessons learned from studies of how humans interact with technology. Rescue robots serve as a trapped disaster victim's lifeline to the outside world. But they are worthless if the victim finds them scary, bossy, out-of-control or just plain creepy. "The term that keeps coming up is 'creepy.' People find the robots that are supposed to be helping them creepy," Murphy said. She and Nass are working to ease the "creep" factor in rescue robots. The researchers also hope to improve the devices in ways that will make them more valuable to law enforcement, such as in hostage negotiations, as well as in emergency response situations, where robots already are in use. Credit: Texas A&M University

Provided by National Science Foundation

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