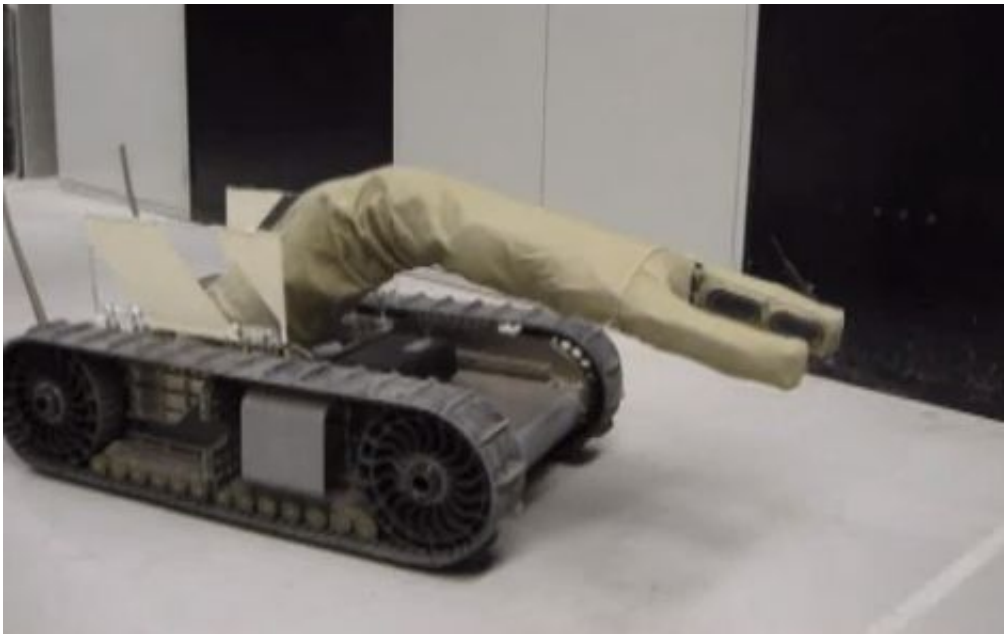
DARPA to invest in iRobot's inflatable robot arm

August 22 2012, by Bob Yirka



(Phys.org) -- In military operations there are a lot of things that need to be done besides fighting, and the US government is hoping to offload as much of those things as possible to robots. To that end, the Defense Advanced Research Projects Agency (DARPA) has directed funds at all manner of projects aimed at developing robots that can haul heavy loads, diffuse bombs, traverse mine fields, etc. Thus far however, most such efforts have been focused on heavy duty jobs with heavy duty robots. Now, however, it appears DARPA has recognized a new need: smaller,

lighter robots that can perform more tactile tasks in chorus with human soldiers. The agency is about to award iRobot (of Roomba fame) $625,000 to build an inflatable robot arm that can pick things up and set them down in a reliable fashion and that won't cause harm to soldiers if they should run into each other.

In a war, sometimes it would be convenient if a robot were able to zip out from behind cover to retrieve a thrown grenade then carry it off some safe distance, for example. The problem is, conventional robots are too cumbersome and heavy for soldiers to carry and too slow and energy sapping to follow them around like pet dogs. For this reason, it's become clear that something lighter needs to be developed, and smaller would be good too if it's to fit on a soldier's back. This is why DARPA is looking at an inflatable robot that could use air pressure to squeeze an object as a way of picking it up. The result so far, a prototype called the Advanced Inflatable Robot, or AIR when installed on top of iRobot's Unmanned Ground Vehicle, is a robot arm that inflates when commanded then grabs objects such as a soda bottle or suitcase handle, by inflating the hand part of the arm around the object.

While clearly still in the development stage, the AIR prototype weighs just half a pound, yet it can lift objects as heavy as three pounds, which is really impressive when compared to its heavy duty cousins which typically can lift objects that are just a fraction of their own weight. Also, in testing the prototype, the air pressure was reduced which means that adding more would allow the robot to pick up heavier objects, a clear indication that iRobot is on to something, which accounts for the money DARPA is giving them to proceed with developing the robots into something that could one day make their way to the battlefield.

More information: via Wired