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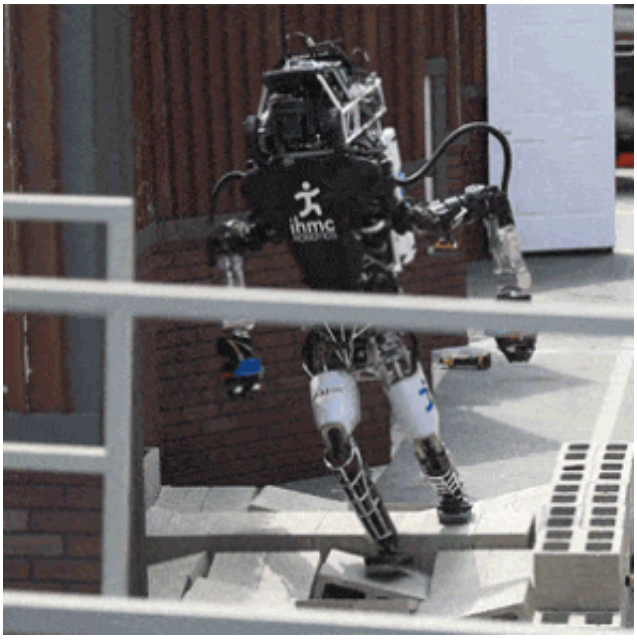
Why Robots and Humans Struggled with DARPA's Challenge

By Will Knight on June 9, 2015

The falls and fumbles of robots in the DARPA Challenge point to the remaining hurdles for human-robot interfaces.

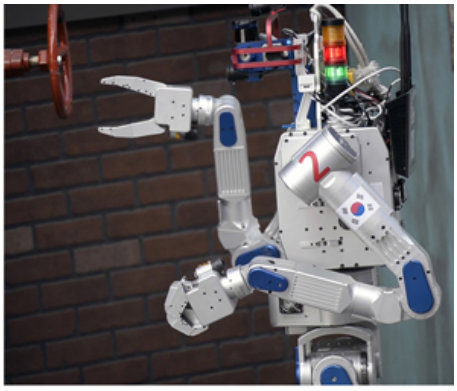
6 COMMENTS



When some of the world's most advanced rescu
complex than a doorknob, you get a good sense
homes and workplaces more automated.

At the DARPA Robotics Challenge, a contest he
two dozen extremely sophisticated robots did t
tasks on an outdoor course, including turning a
opening a door (see "A Transformer Wins DARP
Although a couple of robots managed to compl
air, walked into walls, or simply toppled over as
impossibility of it all. At the same time, efforts b
robots through their tasks may offer clues as to
could be deployed in various other settings.

“I think this is an opportunity for everybody to s
Mark Raibert, founder of Boston Dynamics, now
an extremely sophisticated humanoid robot call
Technologies 2014: Agile Robots”). Several tear
Challenge used Atlas robots to participate. Oth
built from scratch.



Atlas can balance dynamically, meaning it can walk at a brisk pace or stay balanced on one leg even when given a push. Even so, stability proved difficult for bipedal robots at the DARPA challenge during maneuvers such as walking across sand, striding over piles of rubble, and getting out of a car. Several of the teams using Atlas saw their robots come crashing to the ground during the contest.

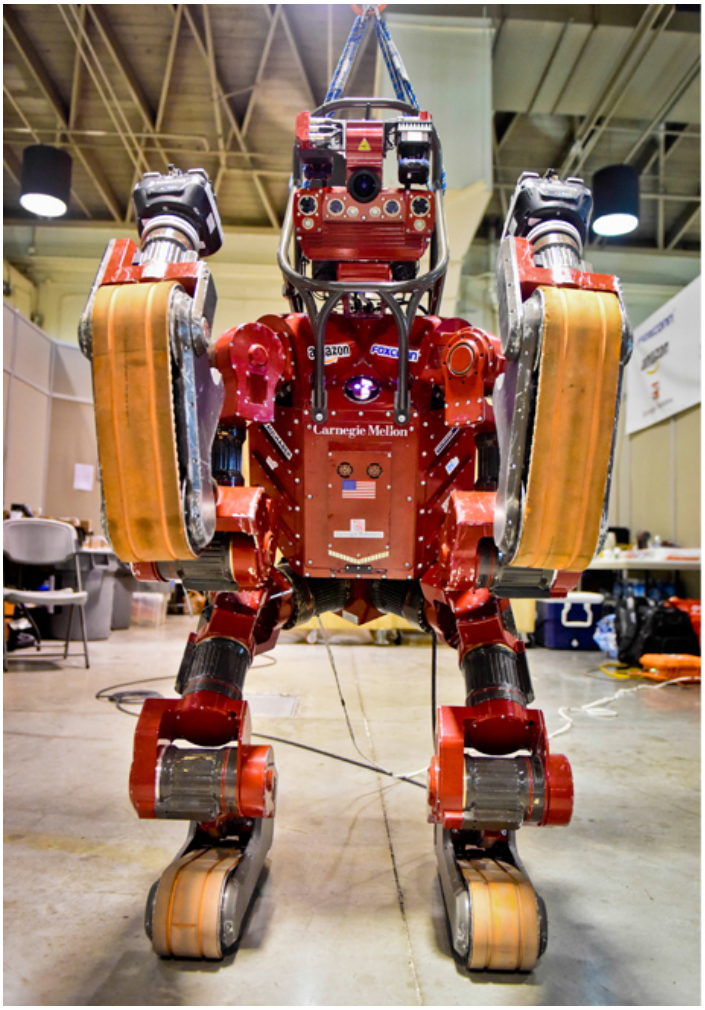
The way many robots struggled to grasp objects and use them properly also highlighted the difficulties in perfecting machine vision and manipulation. Picking up an electric drill and using it to cut a hole in a wall proved especially challenging for most of the robots. T Robot sensors struggle to see shapes accurately in the kind of variable lighting found outside, and robot hands or grippers lack the delicate, compliant touch of human digits.

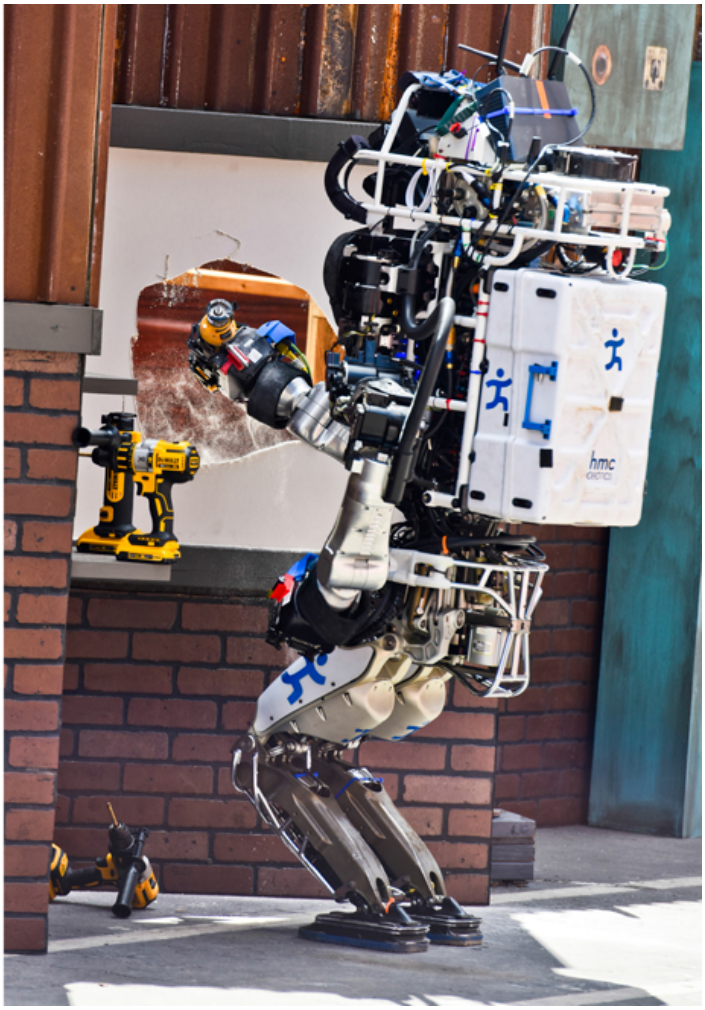
The robots involved in the event weren't always
was hard for spectators to know when they wer
simulate the conditions faced by a tele-operate
station, so communications were throttled to si
encouraged teams to give their machines some
a human controller to step in when things went

The teams involved in the competition used diff
from MIT, for instance, made their Atlas robot, c
autonomously. The team's human operators co
that might contain a lever, and let the robot plar
action. However, they could also take more dire

In contrast, Team Nimbro from the University of
direct control, with nine different people contro
(at one point a team member donned an Oculus
a gesture-tracking system to control the robot).
seven out of eight points, while the team from M
number of points but a slower time.

The teams that performed best in the challenge particularly careful approach to blending robot principle investigator for the sensor system in D KAIST, a research university in Korea, cited hum team's success. "These tasks require a good co [the robot's] recognition and understanding the worked very hard to make a nice balance betwe





The team that finished in second place, from th Machine Cognition, used a sliding scale of auto more decisions and control if its robot seemed suggested the robot would run into problems by approaches could become more important as m introduced in settings such as factories.

The team from Carnegie Mellon University, whic followed a similar approach, according to team advancement here is the robots and the human something," Stentz said. "The robot does what t does what the human is good at."

Gill Pratt, the DARPA program manager who or
said it was important to realize that the level of
was still quite limited, even if their actions some
things are incredibly dumb," he said. "They're m

Credit: Photographs by Stuart Palley

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