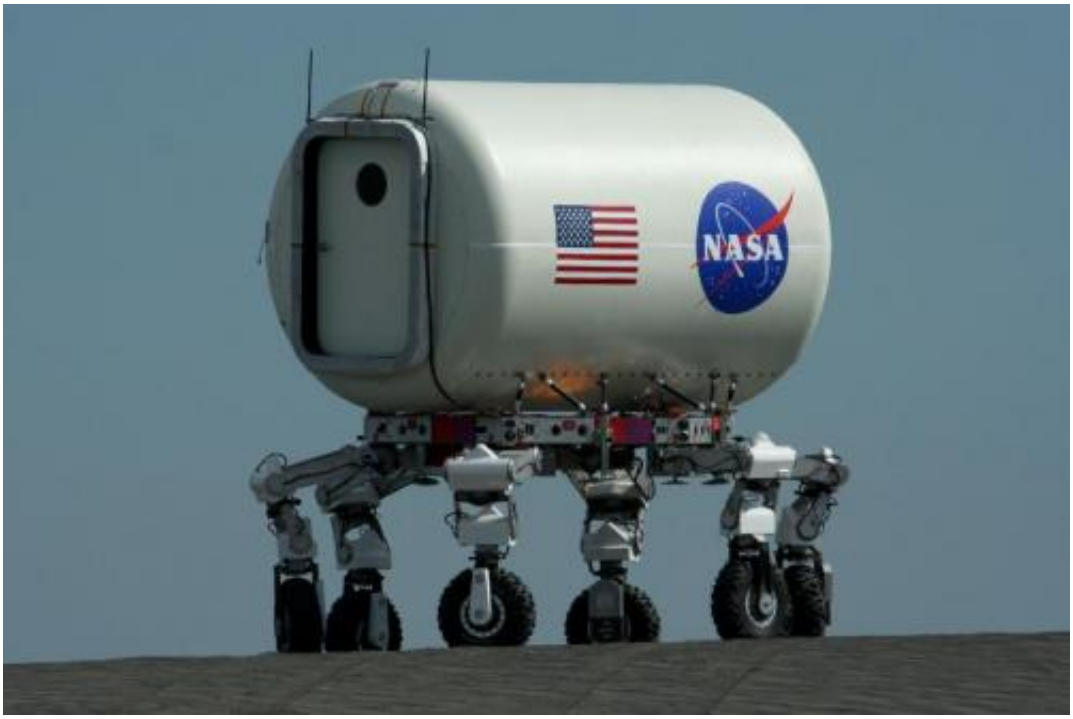
NASA uses Leap Motion to move ATHLETE rover (w/ video)

April 1 2013, by Nancy Owano



Credit: NASA

(Phys.org) —NASA representatives were at the 2013 Game Developers Conference (GDC) in San Francisco to show how the ATHLETE robot, a six-legged robot developed at the Jet Propulsion Laboratory in southern California, can move via remote control with the Leap Motion device. Victor Luo and Jeff Norris, from the Jet Propulsion Lab in Pasadena, presided over the demo. Luo told the audience of game

industry professionals:

"The ATHLETE (All-Terrain Hex-Limbed Extra-Terrestrial Explorer) has six legs and six degrees of freedom, six joints. What part of our body has that much manipulation power? Well, it turns out, our hands have similar dexterity. We mapped our hands to the robot; we did so using the Leap Motion device. Just for you guys today, we are going to do something special."

He told the GDC audience that he and Norris would be moving the six-legged, one ton robot in the southern California laboratory via the Leap Motion device with them onstage at the GDC event in San Francisco. Mission successful. The robot responded, reacting to finger and wrist movements. The audience at the Moscone Center watched all this on a big screen.

ATHLETE's purpose, as an R&D project at NASA, is to behave as a support for human exploration in extreme environments—the moon, Mars, and beyond. Norris sees a day when humans can use devices like Leap Motion to explore the universe remotely. Said Norris, "I want us to build a future of shared immersive tele-exploration, everyone exploring the universe through robotic avatars alongside our astronauts...stepping inside a holodeck and standing on those distance worlds."

The ATHLETE is 13 feet. Various descriptions include "robotic lunar rover test-bed" and "legged lunar cargo robot ".as ATHLETE can unload bulky cargo Its reach is about 20 ft. (It is said that ATHLETE would be able to climb slopes up to 35° on solid surfaces and 25° on soft surfaces, such as soft deposits.

The design includes six Degrees-of-Freedom limbs, each with a 1 DoF wheel attached. The wheels are designed for driving over stable terrain, but each limb could serve as a general-purpose leg, placed in an

alternative walking mode, whereby the wheels could be locked and used instead as feet, over difficult terrain. Another ATHLETE feature is its limbs' adapters, allowing tools to be drawn out and maneuvered by the limb.

Luo is the Task Lead, NASA Jet Propulsion Laboratory (JPS). He leads the development of natural user interface technologies for commanding robot navigation and dexterous manipulation. Norris is Manager of Mission Planning and Execution at JPS. He is involved with the software, people, and processes that command fifteen robotic spacecraft throughout the solar system.

More information: www-robotics.jpl.nasa.gov/syst … system.cfm?System=11