# Japan scientist makes 'Avatar' robot

February 10 2012, by Miwa Suzuki

An operator -- wearing a special HMD and a pair of gloves -- controls the "Telesar V" (right) that was developed by Keio University's Graduate School professor Susumu Tachi (not in the picture) at his laboratory in Yokohama, suburban Tokyo. The robot that mimics the movements of its human controller is bringing the Hollywood blockbuster "Avatar" one step closer to reality.

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closer to reality.

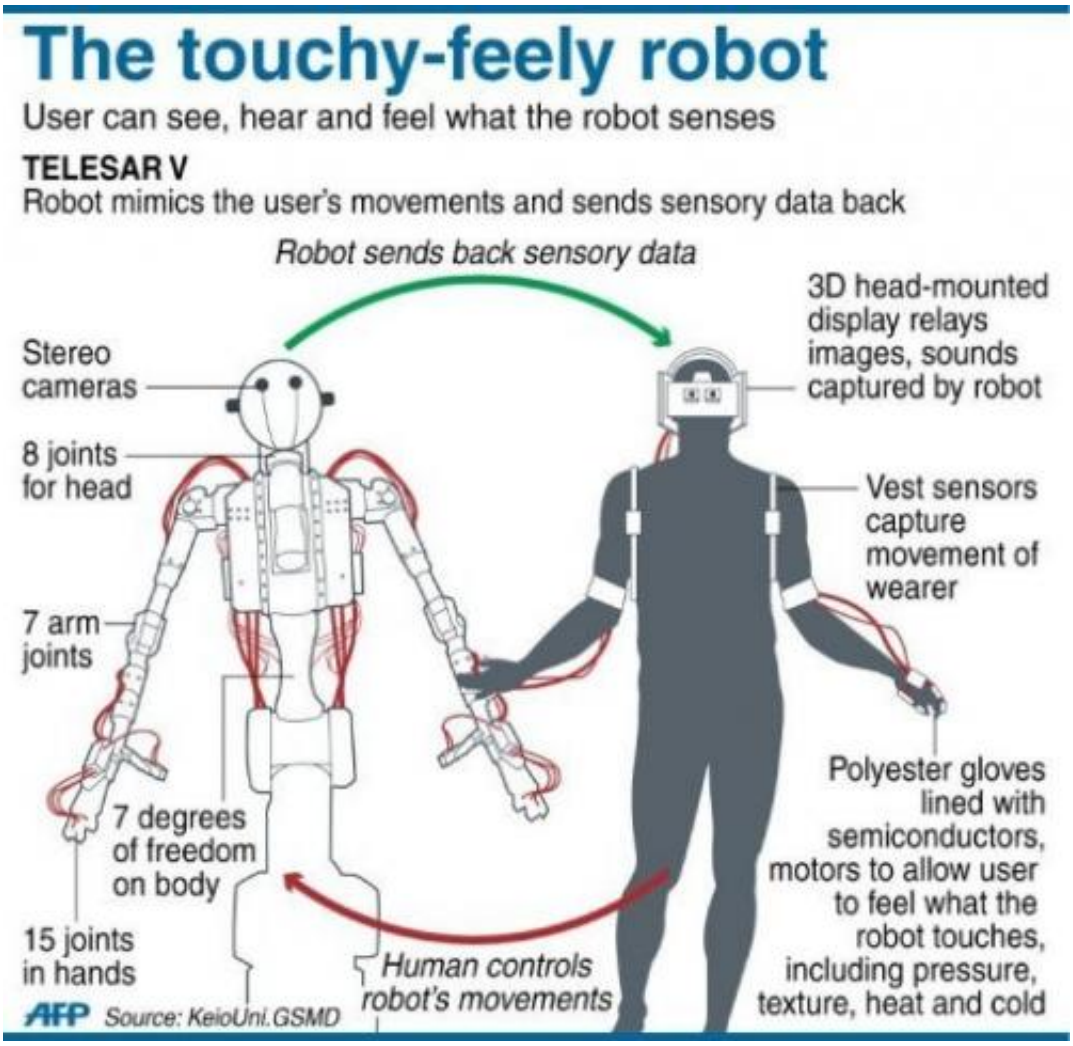
Users of the TELESAR V don special equipment that allows them not only to direct the actions of a remote machine, but also to see, hear and feel the same things as their doppelganger android.

"When I put on the devices and move my body, I see my hands having turned into the robot hands. When I move my head, I get a different view from the one I had before," said researcher Sho Kamuro.

"It's a strange experience that makes you wonder if you've really become a robot," he told AFP.

Professor Susumu Tachi, who specialises in engineering and virtual reality at Keio University's Graduate School of Media Design, said systems attached to the operator's headgear, vest and gloves send detailed instructions to the robot, which then mimics the user's every move.

At the same time, an array of sensors on the android relays a stream of information which is converted into sensations for the user.




Graphic on the TELESAR V robot that mimics the movements of its human controller, and relays back data on what it sees, hears and feels

The thin polyester gloves the operator wears are lined with semiconductors and tiny motors to allow the user to "feel" what the mechanical hands are touching -- a smooth or a bumpy surface as well as heat and cold.

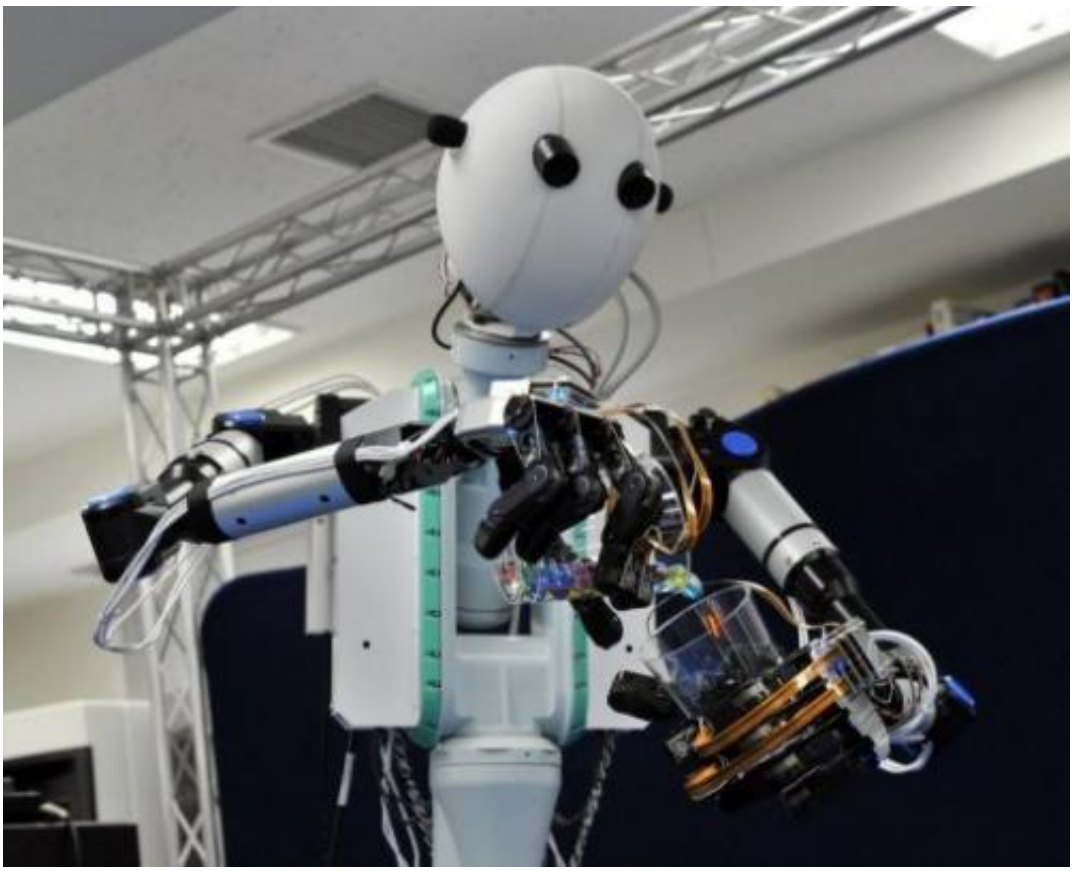
The robot's "eyes" are actually cameras capturing images that appear on tiny video screens in front of the user's eyes, allowing them to see in

three dimensions.

Microphones on the robot pick up sounds, while its speakers allow the operator to make his voice heard by those near the machine.

The TELESAR -- TELexistence Surrogate Anthropomorphic Robot -- is still a far cry from the futuristic creations of James Cameron's "Avatar", where US soldiers are able to remotely control the genetically engineered bodies of an extra-terrestrial race they wish to subdue.

But, says Tachi, it could have much more immediate -- and benign -- applications, such as working in high-risk environments, for example the inside of Japan's crippled Fukushima nuclear plant, though it is early days.



A master-slave robot "Telesar V", developed by Keio University's Graduate School of Media Design professor Susumu Tachi transfers marbles from a cup to another cup during a demonstration at Tachi's laboratory in Yokohama, suburban Tokyo, on February 8. The robot that mimics the movements of its human controller is bringing the Hollywood blockbuster "Avatar" one step closer to reality.

"I think further research and development could enable this to go into areas too dangerous for humans and do jobs that require human skills," he said.

Japan's famously advanced robot technology was found wanting during the crisis at Fukushima, where foreign expertise had to be called on for the machines that went inside reactor buildings as nuclear meltdowns began.

Tachi said a "safety myth" had grown up around atomic technology, preventing research on the kind of machines that could help in the wake of a disaster.

But he said his kind of robot technology could help with the long and difficult task of decommissioning reactors at Fukushima -- a process that could take three decades.

A remote-controlled android that allows its user to experience what is happening far away may have more than just industrial applications, he added.

"This could be used to talk with your grandpa or grandma living in a remote place and deepen communications," he said.

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