Lovotics

ISSN: 2090-9888

Riccillo ML, Lovotics 2014, 1:1
DOI: 10.4172/2090-9888.10000107

Review Article Open Access

Telepresence Robots- Interactions with Robots in Offices

Marcela Leticia Riccillo*

PhD-Researcher in Humanoid Robotics, Argentina

***Corresponding author**: Marcela Leticia Riccillo, PhD Researcher in Humanoid Robotics, Argentina, Tel: 541147842001; E-mail: marce_lr@yahoo.com

Received date: February 20, 2014, **Accepted date**: February 28, 2014, **Published date**: March 10, 2014

Abstract

Telepresence is different from remote control. When you remote control a robot, you could operate at distant places without moving from your desk. You could work in dangerous places like the bottom of the ocean or top of a hill. However, when you control a telepresence robot, the idea is to not only to create your virtual presence, but also to feel the remote situation. There is a Japanese word for describe this “presence”this word is sonzai, it’s like to be “in” the situation. You could think these robots as a personal “avatar”.

Introduction

When we think how you feel things, we must refer to the human senses. And with telepresence robots it is possible to use two of these senses: sight and hearing. Actually, this is for nowbecause there are several experiments about the possibility to transmit/receivesmells, tastes, and tactile sensations over the web. For example, the researches of Professor Adrian Cheok from City University London [1], who is developinga multi-sensory Internet technology [2]

There are classical telepresence robots, like VGo or Beam, and advanced telepresence robots like Telenoid. The classical types are an evolution of communications. When you want to talk with people in other countries, you may use systems like Skype. In this case, you and they see each other through a static screen.Most of the telepresence robots are a floating screen. They consist basically in a monitor–sometimes a tablet, with a microphone and a speaker. The more important part of this device is the wheels: the screen is supported by a plastic or metal column with a base on wheels in order provide the mobility for the robot to move along with people side by side.

A moving screen allows to you go with the other persons through passages, to the next room, even to the coffee shop. Moreover, potential clients of a company can virtually travel to the factory without physically moving from their office. Other applications for telepresence robots are for medicine. The robot RP-Vita from iRobot company and co-developed by In Touch Health, allows medical doctors attend to several patients from several locations in a quick way, just switching controls of the same computer. This robot has obtained the FDA certification in January 2013 [3].

Some examples of features

Every commercial telepresence robot has particular features that allow choose robots based on the goals of every professional or company needs. Let’s see some examples of commercial robots.

VGo [4] is a two-wheeled robot with a six-inch LCD display developed by VGo Communications. It is 4 feet tall so it works fine when interacting with people who are sitting or standing. The battery lasts more than 6 hours between charges -with the possibility to extend that to 12 hours. It has an auxiliary light for dark places and you can move the camera up and down to point things like a face or a paper in a desk. VGo have a text-to-speech system that speaks in its computer voice texts that you type. In August 2013 a concussion study was started, conducted jointly by NAU and the Mayo Clinic in Phoenix, where the robot was used to diagnose concussions in football players [5]

Beam from Suitable Technologies is a telepresence robot with 2 wheels with a top speed over 2 mph [6]. Beam's battery provides 8 hours of active use and a 6-microphone array that cancels echo and reduces background noise.The robot has a big 17" LCD screen, totalizing 62 inches high. When you look at your computer in order to control the robot via the interface, you can see images from two cameras, one facing forward and other pointed down at the floor to help you avoid obstacles. In January 2014, Suitable Technologies introduced Beam+, designed for home users [7].

Ava 500 from IRobot can slide its 21.5” LCD screen up and down to suit the height of a person standing or sitting [8]. Besides, Ava 500 has the feature of autonomous navigation that allows it navigate to selected destination (offices, conference rooms, etc.) without requiring user guidance. To avoid obstacles, the robot uses a LIDAR laser, 3D imaging and sonar technologies.Regarding of communications, robot has two stereo front speakers and an integrated microphone.

QB Avatar was created by AnyBots [9]. It’s different than the other robots because has a small screen and by the design, it seems the head of a real robot with 2 eyes and a hat with the screen. QB’s height is adjustable from 2’8” to 6’2”. It has 2 cameras to see what is straight ahead or directly below around the wheels, 3 microphones and one speaker. In addition, the robot has a built-in laser pointer, to point to objects near it.

Advanced robots

There are several robots with characteristics more specific than the basic characteristics of classical telepresence robots. First, one of the limitations of classic robots is the inability to reach and grab things, like a report on a paper. For that reason, Toyota created the telepresence Human Support Robot (HSR) [10]. The HSR has an arm and gripper for fetching things and picking up objects.

In other hand, the human shape begins to be important to feel the presence of the person on the other side of the communication. On

this, Professor Hiroshi Ishiguro from ATR Lab created a set of robots that resemble the human being appearance. These robots are Geminoid, Telenoid, Elfoid and Hugvie [11].

Geminoid is a line of telepresence robots that are like clones robots. Geminoid-HI is a copy of Dr. Ishiguro himself. These robots cannot walk, but they have arms and legs like humans. They copy the gestures and repeat the sayings, of the person that controls them through a computer with camera and microphone.

Telenoid looks like a human with fewer features. It's like a white doll with face, but without hair. With arms and legs, but without hands and other details.When the person on the other side of the communication moves her/his arms and head, so does the Telenoid. The idea is that the person on one side could project him image on the robot of the other side and make a “feel" that the person is nearto you.

Elfoid is the cellphone version of Telenoid. It’s a small Telenoid to use as a cellphone and then “feel” that the other person is near. Finally, Hugvie is a pillow robot. You connect you mobile phone to the robot and then its internal vibrators match the caller's voice like heartbeats.

Another example of advance telepresence robot is Teroos from Keio University [12]. It’s a little robot that you carry on your shoulder. It has a camera, microphone, and speakers, and it allows a friend to have a virtual presence. For example, if you're traveling, your friend can have the same experience, seeing what you see and chatting along the way, just by sitting at his/her residence.

Future considerations

In my experience, I tried a few commercial telepresence robots and I think they are easy to drive. Generally the user moves the robot with the 4 arrow keys, and then she/he controls the speed with other keys or options on the computer screen. Some robots alert the user that something is about to hit, but I did not feel concerned to avoid bumping into things when I was controlling the robot.

Maybe some points are important to take in to account, like the safety of the robot on the other side of the connection. The robot may fall down or hurt someone. It could fall from stairs if the robot does not have the appropriate sensors and dynamic self-balancing. It could run out of batteries in the middle of a meeting. Moreover, if the robot is used by a student who cannot attend classes, the teacher may keep the robot away as a disciplinary measure.

Another aspect is the privacy, because it’s harder to keep confidential information out of the sight of one who controls the robot, compared to a Skype meeting. And users must be careful that the robot does not enter inside of areas which are not open to public.

However, telepresence robots are a currently trend, and its development is growing in a way, that they will reach your offices before the domestic robots reach your homes. Currently, several conferences allow attending to them through a telepresence robot. Therefore, I think that in a few years, people can take part in events with the help of these robots, for example, to attend an Academy Awards event sitting at home.

References

1. Adrian DC, Jordan T, Gilang AP, Koki T (2013) Touch, Taste, and Smell: Multi-sensory Entertainment. Advances in Computer Entertainment. 516-518.
2. http://adriancheok.info/themedia/
3. http://www.gizmag.com/irobot-intouch-health-rp-vita-medical-fda-approval/25977/
4. http://www.vgocom.com/
5. http://www.usatoday.com/story/sports/ncaaf/2013/08/30/northern-arizon-vgo-mayo-clinic-phoenix-concussions/2736683/
6. https://www.suitabletech.com/
7. http://spectrum.ieee.org/automaton/robotics/home-robots/suitable-technologies-introduces-new-beam-telepresence-system
8. http://www.irobot.com/us/learn/commercial/ava500.aspx
9. https://www.anybots.com/
10. http://www.zembedded.com/human-support-robot-disclosed-by-toyota/
11. http://www.geminoid.jp/en/index.html
12. http://singularityhub.com/2011/03/30/teroos-the-telepresence-robot-you-wear-on-your-shoulder-video/