ICFOSS develops Android-based Tele-presence Robot

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THIRUVANANTHAPURAM, KERALA, INDIA, August 20, 2013 /EINPresswire.com/ -- Trivandrum, August 20, 2013 - Technopark-based International Centre for Free and Open Source Software (ICFOSS) has developed a low-cost tele-presence robot prototype 'TR-7' based on Open Source Hardware and Software platforms. The prototype was developed as a part of an Android R & D project of the Department of Information Technology (DIT), Government of India, currently being implemented by ICFOSS.

The robotic prototype TR-7 was fabricated by Ingen Robotics, a local firm focusing on new-generation robotics, based on specifications provided by ICFOSS. TR-7 is an affordable tele-presence robot, made using locally available components. The user can operate the robot remotely from anywhere in the world using a computer with internet connection and software to control the robot. The user is able to drive around and see and hear the remote location using the robots built in camera and microphone. Anyone in the remote location can also see and hear the user through the robot's display and speakers. Existing software is used for video communication. All other hardware and software components used are available under open licenses.

The robot uses an Android tablet to run its software, and to display the remote user's face. The built in speakers and microphone of the tablet are also used for communication. The software in the tablet communicates via a USB cable with the electronics of the robot, which is built around the open source Arduino platform. This in turn controls the motor drivers that power the motors. TR-7 is a differential drive robot, where the two wheels in the front can be driven independently of each other. This allows the robot to take tight turns. The form of the robot resembles a kneeling biped. The user can connect to the robot using any linux pc on which the remote control and communication software can be run.

Telepresence robots are devices that are controlled remotely by a human operator, typically from a laptop, over the Internet or other kinds of networks. Using audio, video and control electronics, the remote operator is able to see, interact with, navigate and even manipulate remote objects. The people around the robot can see and talk to the remote operator as well.

Telepresence robots have applications in Industries such as medicine (with remote experts who can cover a whole ward), agriculture (remote inspection of greenhouses as well as farms using all-terrain transport), industrial security (robots which can enable surveillance cover homes or complex buildings (with the human observers being off-site) and in hazardous conditions (chemical, & radioactive environments, fire)

While tele-presence robots have been traditionally very expensive (upwards of US Dollars 10,000), a new generation of these robots have been enabled by modern personal devices such as Tablets and SmartPhones, which are network-enabled and equipped with multiple sensors, cameras and audio devices.

Says R. Srinivasan, Project Manager of the DIT Project of ICFOSS, "The first version of the robot has proven that tele-presence devices based on Open Source platforms such as Android are fully viable. Further work needs to be done on areas such as enhanced robot autonomy, pan-tilt-zoom capability on the robot, and automated homing. These would enable the robot to be used in production applications such as remote inspection and surveillance, in multiple domains such as military applications, agriculture, and infrastructure management."

Rejin Narayanan, CEO, Ingen Robotics, who carried out the fabrication of the robot said, "The main challenges we had to address include designing the navigation electronics as well as the communication protocols between the control station and the robot, especially given the stipulation that only Open Source Hardware & Software were to be used. We hope to achieve a 100% Open Source by the next iteration."

Telepresence robots are rapidly finding applications in domains ranging from offices and public spaces to space, marine & underwater, telemedicine, agriculture, military, and hazardous environments.

http://www.indiaitnews.com/index.php/news/view/911/ICFOSS-develops-Android-based-Tele-presence-Robot.html

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