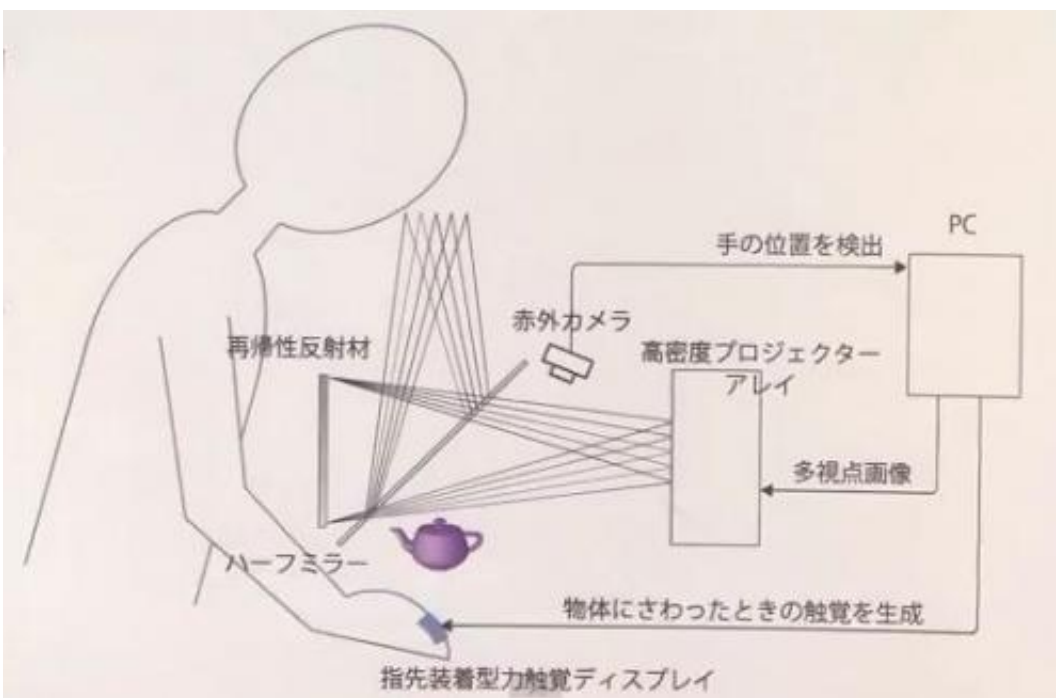# Reach out and touch 3D characters with RePro3D (w/ video)

September 17 2011, by Nancy Owano

(PhysOrg.com) -- Lonely gamers who have felt the pain of being separated by a screen from their favorite personalities now have a way to reach out and touch their game characters, and that new way is RePro3D. A group of researchers from Keio University in Japan have come up with a 3-D screen that lets the user, glasses-free, see and "touch" characters on the screen. The word "touch" is in quotes because the technology is about a 3-D parallax display with infrared camera that

recognizes the movements of the user's hand and the character on the screen reacts to the movements instantly.

Shown at CEDEC 2011, Japan's conference for computer entertainment developers, a team member described their technique: "We use retro-reflective projection technology, using materials with special retro-reflective characteristics. This kind of material reflects light that enters back at the same angle it entered. Using this technology enables a display to show images at a different place from the light source."

A user's tactile device worn on the fingers is designed to enhance the sensation of touching the objects on a 3-D screen.

The team wrote about their project vision last year, in a paper which appeared in Proceedings: SIGGRAPH Emerging Technologies. They said at the time that, in 3-D display research, they are not alone. "In recent years, many 3D display methods that enable parallax images to be seen with the naked eye have been developed. In addition, there has been an increase in research to design interfaces that enable humans to intuitively interact with and operate 3D objects using their hands." The problem with these attempts is that creating a sensation of being able to touch a screen object is easy to imagine but is difficult to implement.

Some impediments have been conventional screen shapes restricted to flat panels. It has been hard to match perfect positions and images that users were touching on the display, they wrote. "We propose a novel full-parallax 3-D display system that is suitable for interactive 3D applications.

"When a user looks at the screen through a half mirror, he or she, without the use of glasses, can view a 3-D image that has motion parallax . We can choose the screen shape depending on the application. Image

correction according to the screen shape is not required. Consequently, we can design a touch-sensitive soft screen, a complexly curved screen, or a screen with an automatically moving surface."

In the future, they plan to build a touchable 3-D display system that expands the size of the visible image, so that multiple people can be in the same space, and can share the same image.

 More information:
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