New device to revolutionize gaming in virtual realities (w/ Video)

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Tuncay Cakmak and the Virtualizer.

How is it possible to walk through 3D virtual realities while staying in one place? Engineers from the Vienna University of Technology have solved this problem and are now introducing their "Virtualizer".

Head-mounted devices, which display three dimensional images

according one's viewing direction, allowing the users to lose themselves in computer generated worlds are already commercially available. However, it has not yet been possible to walk through these virtual realities, without at some point running into the very real walls of the room. A team of researchers at the Vienna University of Technology has now built a "Virtualizer", which allows for an almost natural walk through virtual spaces. The user is fixated with a belt in a support frame, the feet glide across a low friction surface. Sensors pick up these movements and feed the data into the computer. The team hopes that the Virtualizer will enter the market in 2014.

Digitized motion

Various ideas have been put forward on the digitalization of human motion. Markers can be attached to the body, which are then tracked with cameras – this is how motion capture for animated movies is achieved. For this, however, expensive equipment is needed, and the user is confined to a relatively small space. Prototypes using conveyor belts have not yet yielded satisfactory results.

Tuncay Cakmak, a student at TU Vienna, had a much better idea; when the feet slide across a smooth low-friction surface, almost natural walking movements are possible without in fact changing one's position. Together with some other students and virtual reality expert Hannes Kaufmann (TU Vienna), he developed the "Virtualizer".

In the Virtualizer's metal frame, the user is kept in place with a belt. The smooth floor plate contains sensors, picking up every step. Rotations of the body are registered by the belt. "Coming to terms with the low friction takes a little bit of practice", says Tuncay Cakmak, "but soon one can run across the smooth sensor plate quite naturally."

Run, look, duck, jump

The Virtualizer can be used with standard 3D headgear, which picks up the users viewing direction and displays 3D pictures accordingly. This is independent from the leg motion, therefore running into one direction and looking into another becomes possible.

Moving through virtual realities using a keyboard or a joystick can lead to a discrepancy between visual perception and other body sensations. This is a problem for the brain: "Many people become nauseous in such situations. This is called 'cybersickness'", says Tuncay Cakmak. In the Virtualizer, however, the displayed visual data is in line with one's physical motion. The feeling of presence in the virtual world is stronger, and it becomes easier to assess distances and proportions. In addition, movement in the Virtualizer has an element of physical exercise.

Entering the market

The prototype developed at TU Vienna already works very well – only some minor adjustments are still to be made. The Virtualizer has already caused some a stir. "Some major companies have already expressed their interest – for us, however, it is important that the technological development remains in our hands", says Tuncay Cakmak.

The Virtualizer is scheduled to enter the market as soon as 2014. The price cannot be determined yet. "Our first priority is to create a high quality product, but of course we want to offer it at the lowest possible price", says Cakmak. "Our product should lead virtual reality out of the research labs and into the gamers' living rooms."

Provided by Vienna University of Technology