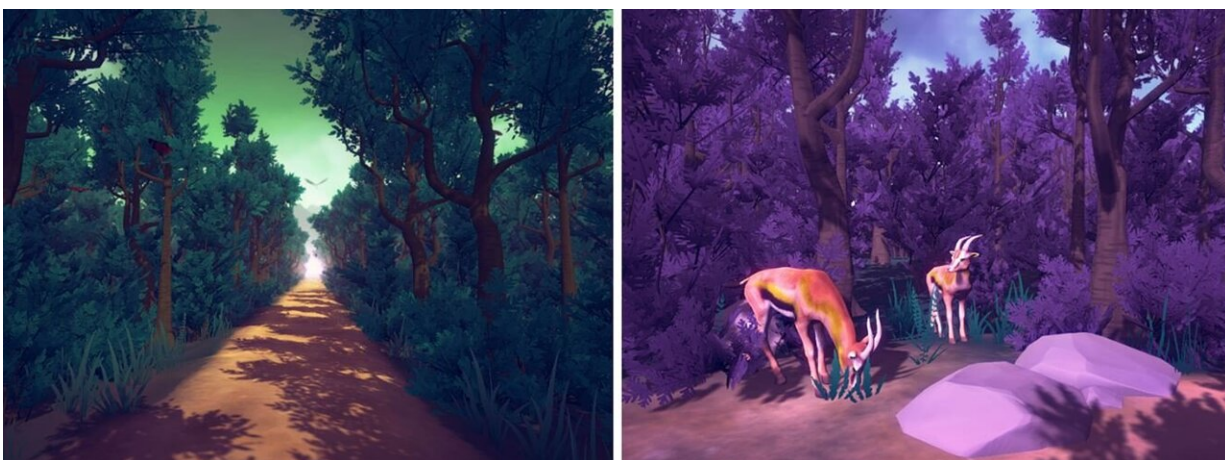


Using virtual reality, researcher tricks patients with intermittent arterial claudication into walking longer distances

December 10 2019, by Merijn Van Nuland



Screenshots of the virtual woods. Credit: Anne Cuperus

People with intermittent arterial claudication often experience severe pain when walking. Psychologist Anne Cuperus used virtual reality to trick 20 patients, and discovered that they could suddenly walk much further. Ph.D. defense on 10 December.

Around 400,000 people in the Netherlands suffer from intermittent arterial claudication. This refers to [severe pain](#) during walking and other [physical activities](#), and is caused by a build-up of plaque in the arteries. However, more [physical exercise](#) can actually reduce the symptoms, and

is thus an important part of the solution.

How do you get people to exercise more if that is precisely what causes them pain? This is the question that psychologist Anne Cuperus sought to answer in his Ph.D. research. He sent 20 patients into the woods for this—a virtual wood that is. He used virtual [reality](#) to create a [wood](#) populated with gazelles, camels and giraffes with a trail for the patients to follow. Whereas they were really walking on a treadmill, the VR headset had them venturing into the wild.

Sneaky stretch

The patients were told to walk as far as they could until the pain in their legs became too intense. The research showed that virtual woods didn't magically have them walking further than they did on a plain treadmill. What did help, however, was to give the virtual woods a sneaky stretch. Then the patients suddenly walked further.

"After the first walk in the woods, we placed a flag to mark the spot where the previous session had ended," says Cuperus. "In the meantime, I gave the woods a bit of a stretch, which meant that, without noticing it, you had to walk further to reach the same flag. None of the 20 [test subjects](#) noticed this manipulation, and they walked significantly further than in the first walk." Cuperus is thus playing with the [placebo effect](#), which is also one of the research fields of his supervisor Andrea Evers, who was awarded the famous Stevin Prize this year for her research into this effect.



Screenshots of the virtual woods. Credit: Anne Cuperus

Reasoning from technology

For his research, external Ph.D. candidate Cuperus combined his knowledge of psychology and IT. While conducting his research, he also worked at a company that develops mobile apps for companies such as Vodafone, Ziggo and RTL. "People often look at what a medical party needs and then build an IT solution around this," he says. "For the woods, I began to reason from the possibilities of virtual reality and then looked at how these could be used in medical practice. This approach can lead to surprising innovations."

In a second line of research (this time at Utrecht University) Cuperus investigated a new use of virtual reality for research into psychotrauma. For this research, he used a virtual house of horrors with scary noises and a zombie girl who could have stepped right out of horror film *The Ring*. "This [virtual reality](#) game enabled us to give healthy test subjects negative memories that we could then test experimental interventions on. This means you don't have to bother patients."

Provided by Leiden University

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