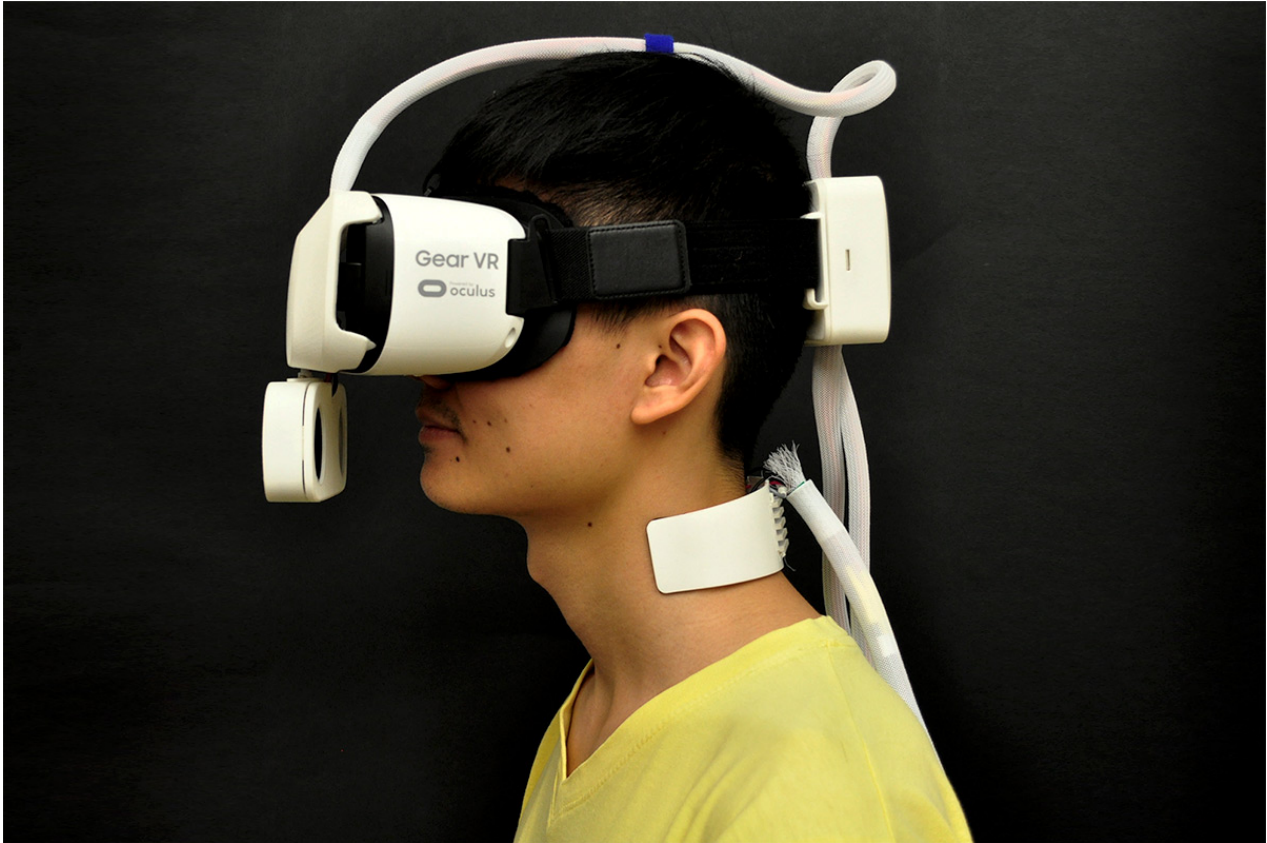


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## Virtual reality weather add-ons let you feel the sun and wind



Prepared for the weather  
National University of Singapore

By Timothy Revell

Virtual reality devices can already fool your eyes and ears. Soon your other senses will be fooled too, with the creation of a device that can bring the weather in your virtual world to life.

Nimesha Ranasinghe at the National University of Singapore is working towards the ultimate VR experience. Last year, his team showed how electrodes can be used to add sweet tastes into virtual reality. His new accessory, called Ambiotherm, adds atmosphere into the mix as well.

Ambiotherm has two components that combine with a normal VR headset. The first is a wind module that contains two fans that clip on to the bottom of a headset.

“This means that we can simulate the wind blowing in your face, for example, as you ski down a mountain,” says Ranasinghe.

The second is a temperature module that attaches to the back of the neck. “So when walking through a virtual desert, we can simulate the harsh sun beating down on you,” he says.

### Whole body experience

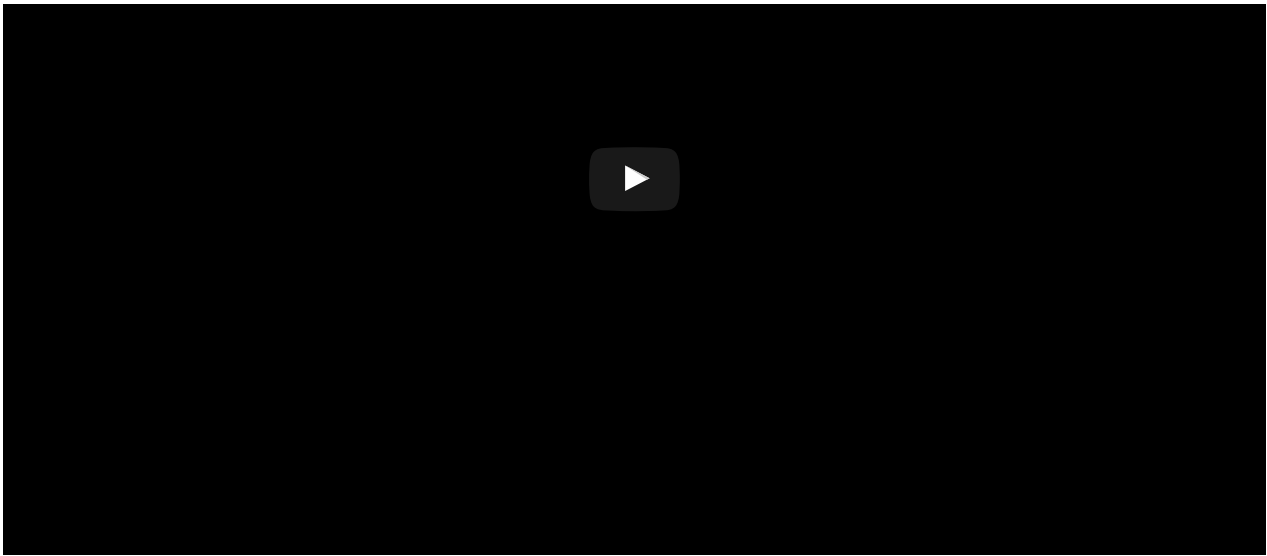
The accessories don't just affect the area they are pointing at, though. In previous experiments, Ranasinghe and his team found that if heat is gradually applied to the neck it feels like the whole body is experiencing a different temperature. Similarly, wind passing the throat can give the impression of standing somewhere windy.

“Visuals and sounds are the easiest part of the real world to replace. It's much more difficult to simulate other senses, so it's really interesting what they've done,” says Adalberto Simeone at the University of Portsmouth, UK.

Other attempts to emulate environmental conditions in VR experiences normally involve a room with fans and heat lamps dotted around, says Simeone, so making it compact is a big achievement.




By making VR more realistic it could increase the possible uses. Researchers have already shown that VR can reduce pain, reduce fear of death, and even help people who are paralysed regain some feeling in their legs.

“We're studying how human emotion can be augmented using multisensory VR. The next step is to start including smells and vibrations,” says Ranasinghe. Ambiotherm will be presented at the Conference on Human Factors in Computing Systems in Colorado in May.



A shorter version of this article was published in *New Scientist* magazine on 18 February 2017

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