

Virtual reality motion sickness may be predicted and counteracted

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Researchers at the University of Waterloo have made progress towards predicting who is likely to feel sick from virtual reality technology.

In a recent study, the researchers found they could predict whether an individual will experience cybersickness (motion sickness caused by [virtual reality](#)) by how much they sway in response to a moving [visual field](#). The researchers think that this knowledge will help them to develop counteractions to cybersickness.

Cybersickness involves nausea and discomfort that can last for hours after participating in virtual reality (VR) applications, which have become prevalent in gaming, skills training and clinical rehabilitation.

"Despite decreased costs and significant benefits offered by VR, a large number of users are unable to use the technology for more than a brief period because it can make them feel sick," Séamas Weech, a postdoctoral research fellow at the Department of Kinesiology and lead author of the paper. "Our results show that this is partly due to

differences in how individuals use vision to control their balance. By refining our predictive model, we will be able to rapidly assess an individual's tolerance for virtual reality and tailor their experience accordingly."

In conducting their work, the researchers collected several sensorimotor measures, such as balance control and self-motion sensitivity, from 30 healthy participants aged 18-30.

The researchers then exposed the participants to VR with the aim of predicting the severity of [motion sickness](#). Using a regression model, they significantly predicted how much cybersickness participants experienced after being exposed to a zero-gravity space simulator in VR.

"Knowing who might suffer from cybersickness, and why, allows us to develop targeted interventions to help reduce, or even prevent, the onset of symptoms," said Michael Barnett-Cowan, neuroscience professor in the Department of Kinesiology and senior author of the paper. "Considering this technology is in a growth phase with industries such as gaming, design, medicine and automotive starting to use it, understanding who is negatively impacted and how to help them is crucial."

The study, Estimating the sensorimotor components of cybersickness, was co-authored by Weech, Barnett-Cowan and Jessy Parokaran Varghese in the *Journal of Neurophysiology*.

Provided by University of Waterloo

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