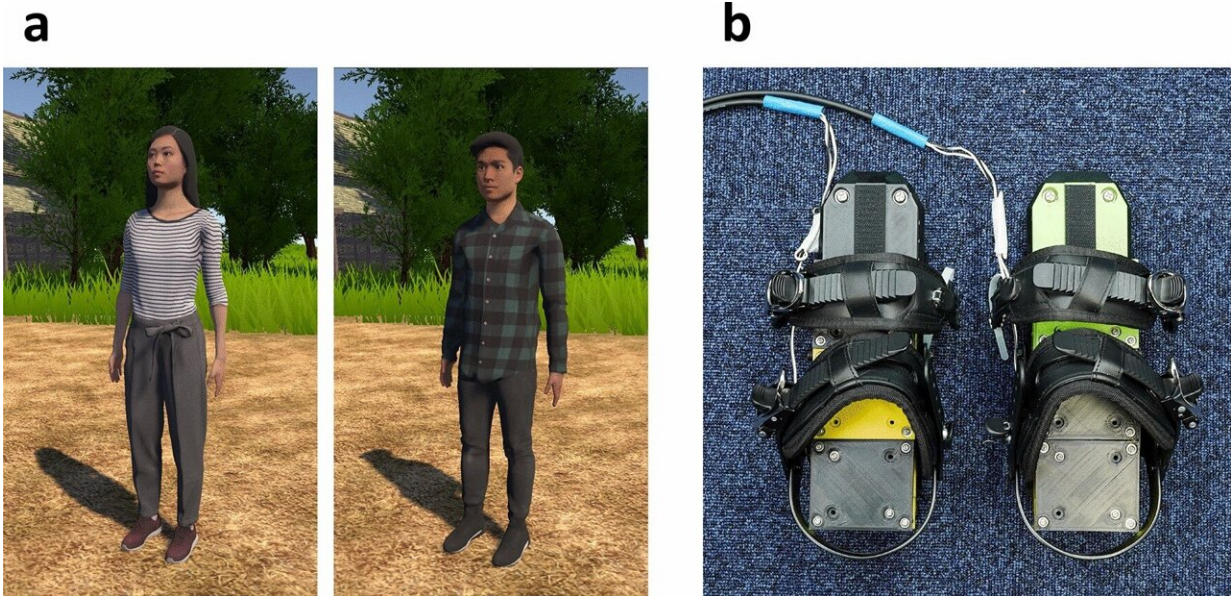


Synchronized foot vibrations improve virtual walking experiences, study shows

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(a) Two types of avatar. (b) Foot vibration system device. Credit: *Scientific Reports* (2024). DOI: 10.1038/s41598-024-70229-5

New research reveals that synchronized foot vibrations and posture significantly enhance virtual walking experiences for stationary observers, improving self-motion, walking sensation, and embodiment. Standing posture was most effective, but sitting and lying positions also benefited from synchronized vibrations. These findings have practical applications in virtual reality (VR) for training, rehabilitation, and entertainment, offering improved immersion and realism even for users

with physical limitations.

The research was [published](#) in *Scientific Reports* on August 21, 2024.

Virtual walking systems are increasingly important as VR technology advances, especially for users who cannot move freely due to physical limitations. While traditional VR experiences focus on visual, auditory, and [tactile cues](#), this study explored how posture and synchronized foot vibrations impact the effectiveness of these simulations. The goal was to improve the realism of virtual walking under different physical conditions.

The study showed that synchronized foot vibrations enhance sensations of self-motion, walking, and embodiment, especially in a standing posture. However, sitting and lying on the back also benefited, though the differences between these postures were sometimes minimal. These findings suggest that integrating tactile feedback with [visual cues](#) can make VR experiences more effective and accessible for a broader range of users.

In the future, these results could help develop more inclusive VR experiences, particularly for people with limited mobility. Potential applications include [rehabilitation programs](#) that allow patients to engage in virtual walking exercises from different positions or more realistic VR training simulations. This technology could also make everyday VR entertainment more immersive and accessible, regardless of the user's physical posture.

More information: Junya Nakamura et al, The effect of posture on virtual walking experience using foot vibrations, *Scientific Reports* (2024). [DOI: 10.1038/s41598-024-70229-5](https://doi.org/10.1038/s41598-024-70229-5)

Provided by Toyohashi University of Technology

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