

"A virtual world where two people walk together... A sensory coexistence experience" GIST presents ultra-slim omnidirectional treadmill technology at 'MVEX 2025'

- Professor Jung Won Yoon's research team develops a next-generation 360-degree treadmill that improves the problems of existing 360-degree treadmills... Unveiling of metaverse walking interaction platform technology using ultra-thin, ultra-high-speed 360-degree treadmills
- Exhibiting research results at the 'Immersive Experience Zone' at the '2025 Metaverse Expo (MVEX 2025)' held at COEX in Seoul for three days from Wednesday, June 18 to Friday, June 20



▲ GIST AI Convergence Department Professor Jung Won Yoon's research team is participating in the '2025 Metaverse Expo', exhibiting an ultra-slim, ultra-high-speed 360-degree omnidirectional treadmill and presenting the metaverse walking interaction platform technology utilizing it.

An exhibition will be held until the 20th (Friday) where you can directly experience the possibilities of future interfaces through the 'experience of walking together' in a virtual space.

The Gwangju Institute of Science and Technology (GIST, President Kichul Lim) announced that Professor Jung Won Yoon's research team from the Department of AI Convergence will participate in the '2025 Metaverse Expo (METAVERSE EXPO 2025)' held at COEX C Hall in Samseong-dong, Seoul from June 18th (Wednesday) to the 20th (Friday) and present the metaverse walking interaction platform technology using an ultra-slim, ultra-high-speed 360-degree omnidirectional treadmill.

This technology revealed by GIST is attracting attention as a new interface that goes beyond a simple virtual reality experience and implements sensory connection and immersion for users through 'walking together' in a virtual space.

At the center of the 'Immersive Experience Zone' that captures the attention of visitors, a unique scene unfolds where two people wearing HMDs (Head-Mounted Displays) walk side by side in a virtual space on a platform.

This is a scene implemented through the next-generation walking interface 'omnidirectional treadmill' that provides an immersive experience based on actual walking movements, beyond simply looking at a virtual screen.

The device is a multi-user walking system that two or more users can experience simultaneously, and they walk on the treadmill along a virtual path that unfolds in front of their eyes through the HMD.

Visual guidance lines and walking speed guidance are displayed in the field of view, and they are precisely synchronized with the users' actual steps, providing an immersive experience as if they were walking directly in the virtual space.

In particular, the structure in which two people can participate together expands the experience of social interaction and sensory connection in the virtual space beyond a simple individual experience.

Friends, loved ones, and family members walk together or head toward a target point according to their own rhythm, and share an experience of sensory communication and empathy that goes beyond the VR experience.

The technical perfection is also noteworthy. The system is designed with an ultra-slim structure with a thickness of 24cm to increase space utilization, and the design allows for high-speed walking at up to 4m/s, enabling realistic movement implementation.

A helical gear-based planar power transmission mechanism (PHTM) is applied inside, which precisely processes direction changes and rotational movements and stably responds to simultaneous movements of multiple users. This enables high-precision 2D walking simulation even in narrow exhibition spaces, maximizing the immersion of the experimenter.

Professor Jung Won Yoon said, "The walking interface presented this time goes beyond a simple exhibition experience and is the result of a more humane way of interpreting interaction in a virtual space," and added, "We wanted to experiment with the meaning of 'coexistence' in the metaverse through the process of two people walking together, matching speeds, and sharing goals, and we will continue to explore the social expandability and effectiveness of digital technology through research on such convergent interfaces in the future."

Meanwhile, '2025 Metaverse Expo' is Asia's largest metaverse exhibition covering next-generation technologies such as XR, AI, digital twin, edutech, healthtech, and Web3, with various technology companies and research institutes participating to introduce cutting-edge technologies.

In particular, the Immersive Experience Zone is planned as a space to 'experience' technology with the body rather than just 'seeing' it, and is drawing attention as a representative content that has both immersive technology and sensory delivery.