

# Omnidirectional Ground Motion Generating Simulator Technology

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⇒ Interfaces that helps with mutual interaction of human or autonomous machine system in the virtual, augmented, remote working environment and the simulator technology that applies it: The Technology includes the treadmill platform that provides virtual walking or driving environment and the motion platform where the intention of the user is easily input

## Client / Market

- Virtual reality and simulation production/solution company
- Health and rehabilitation device manufacturer/solution company
- Sports and entertainment production/solution company
- Car (including autonomous driving) simulator manufacturer
- National defense/public training simulator manufacturer

## Necessity of this Technology

- Existing simulator uses an unintuitive interface like a joystick to realize the movement of the trainee or the driving motion, which feels less engaged with the virtual reality.
- To verify the operability of increasing autonomy machine system, a virtual reality technology, that could precisely simulate working scenarios of a system to verify the mutual interaction with human, needs to be developed.
- In particular, an omnidirectional treadmill mechanism has never been commercialized. A new affordable mechanism having driving and noise performance at the same time needs to be developed.

## Technical Differentiation

- This technology includes the treadmill and motion plate technology that recognizes the movement speed intended by the trainee or the driving device to move or control the virtual reality environment.
- With this technology, a virtual training system can be utilized for operation training for machines for special works or large machines such as construction machinery to prevent accidents.
- It is expected to be utilized for various fields in the future including combat training for national defense, medical rehabilitation treatment, and sports ability enhancement.
- It uses a low-noise, high-efficiency power transfer driving system for 360-degree omnidirectional ground motion generation and applies the independent power-train mechanism for ground without limitations regarding ground shape and material.
- The moving body (trainee) speed prediction-based feed forward control technology for ground speed control has been verified.
- A low-cost high-precision virtual reality contents control technology using lower body movement and posture is secured to simplify the system.

## DESIRED PARTNERSHIP

Technology Transfer

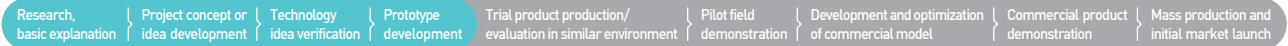
Licensing

Joint Research

Other



## TECHNOLOGY READINESS LEVEL [TRL]



## Excellence of Technology

- An omnidirectional driving mechanism for highspeed, low-noise ground movement is under development.
- The feed forward control algorithm based on foot pressure distribution change rate or movement of center of gravity has been developed.
- A human interface prototype specialized for immersive large-scale virtual reality environment has been developed.
- Simulator technology for fire training and large machine equipment safety has been developed.
- Detection and control simulation technology for prior verification of unmanned/autonomous special working machine for industrial use has been developed.
- Technology for virtual movement simulator for manned/unmanned driving vehicles has been developed.
- A virtual reality prototype for unmanned vehicle system is under development for prior operability verification.

## Human Interface Prototype



## Virtual Movement Support Simulator Technology for Manned/Unmanned Vehicle System



## Current Intellectual Property Right Status

### PATENT

- Omnidirectional Ground Movement Treadmill Mechanism (KR0061073, KR1740945, KR1672705, KR1672702, KR1679223, KR1740921)
- Omnidirectional Ground Movement Simulator Application Technology (KR0052297, KR0057892, KR0052293)
- Ground Movement Simulation Control Technology (KR1650763, KR0052302)
- Simulator for Driving Performance Assessment of Mobility (KR0011568)

### KNOW-HOW

- Driving body-measured data-based virtual reality simulator design technology
- Engineering analysis data-based virtual reality simulator design technology
- Working and driving test system for autonomous machine and its control method
- Autonomous machine system using mixed reality and its control method