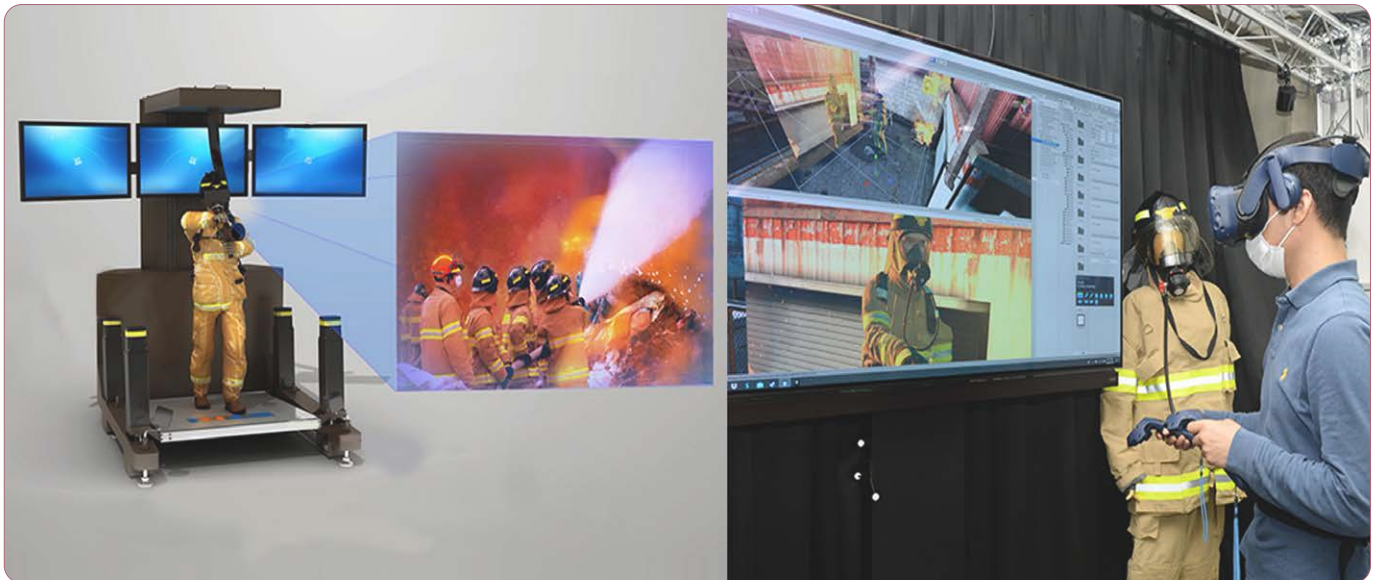


# VR/XR Training System for Disaster & Safety

**A cutting-edge training solution that leverages spatial computing and scenario-based simulations to provide safe and effective disaster response training.**

Through virtual environments, firefighters can anticipate and rehearse their responses to hazardous situations, thus gaining valuable field experience safely and efficiently.



▲ Firefighters engage in training using a highly realistic VR simulation system.

## Issues to Tackle

- ☑ Recreating realistic environments for training in fires, disasters, or counter-terrorism scenarios is inherently difficult.
- ☑ Introducing secure and practical training methods is necessary for frontline responders, like firefighters, safety workers, and soldiers.

## Expected Benefits

- ☑ With VR equipment and motion sensors, trainees can simulate real-world field experiences in a controlled setting.
- ☑ Training duration is reduced by 29%, and the error rate drops to 1/6.

## 💡 Key Services

- Up to 200 trainees can simultaneously participate in team-based training, each performing their designated roles.
- Training scenarios, such as fire location, size, and environmental conditions, can be customized to match the scale and nature of the exercise.
- 3D-simulated fire models and unpredictable scenarios are utilized within virtual building environments.
  - \* Realistic fire, smoke, water, steam, and combustion effects are generated with flame and smoke simulations.

## ⚙️ Use Cases

- The National Fire Agency initiated the “Immersive Advanced Fire Training System Development Project” in 2019 and successfully conducted verification tests until 2025.
- The municipal government of Daejeon adopted digital twin-based immersive video content for fire training programs in September 2024 covering eight high-density locations, including department stores, hotels, and libraries.
- The National Police Agency introduced the “POLICE ONE” immersive VR training system in October 2022, offering VR content and evaluation tools for suspect apprehension, suppression, and arrests.

## Key Components

### Configuration

#### Training Server, Training Content

High-rise Mixed-Use Building Fire



Subway Fire

Earthquake

Infectious Diseases Response

Car Accident

Hazardous Chemical Leak

#### Virtual Training Devices

Position Tracker, Haptic gloves, Motion Capture Sensor, etc



#### Target Participants

Head-Mounted Display (HMD) Devices



### Technology

#### 1. VR HMD

- Enables location-based training with an immersive VR environment and sensing technology.

#### 2. M&S (Modeling and Simulation)

- Implements flame characteristics, fire spread, and special phenomena based on FDS (Fire Dynamics Simulation) results, considering the material properties of combustibles.

#### 3. Multi-Sensors

- Uses sensory transition sensors, motion sensors, and position tracking sensors to enable virtual training without actual firefighting equipment.

#### 4. Machine Learning and Big Data

- Provides feedback on training based on big data and improves scenario performance through learning.

#### 5. Dedicated Server, Network, and Synchronization Technology

- Supports large-scale team-based tactical training models, such as Level 3 response scenarios.



#### Motion Capture System



- I Motion: Full-body sensor-based motion capture



- Sigma Optics: Supports simultaneous multi-access position tracking

#### Haptic Device



- Sigma Glove: Captures movements of 10 fingers with vibration and temperature feedback



- Sigma Suit: Provides 300 tactile feedback points with low-frequency vibration stimulation



- Sigma Control: Tracks position and posture with a haptic controller

### Technology Companies

**INTERACT**  
www.interactcorp.co.kr

**IPOP**  
www.ipopkorea.com

**RAUN METADEMY**  
www.metademy.ac

**SKONEC**  
www.skonec.com

