

# 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 connect on-site for team-based training tailored to their roles.
- Training scenarios can be customized based on fire location, scale, weather, and other disaster site conditions.
- Provides simulated fire models and unexpected scenarios in 3D environments of actual buildings.
  - \* Realistic fire scenarios with flames, smoke, water, steam, and fire phenomena simulated using advanced technology.

## Use Cases

- The National Fire Agency began building a virtual fire training system in 2019 and is pursuing the creation of various complex spaces by 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 has been building a VR police training system (POLICE ONE) since October 2022 and is applying it to situation-specific training such as subduing and arresting suspects.

## Key Components

## Configuration

## Training Server and Content

High-rise residential fire



Underground fire

Earthquake

Infectious disease response

Traffic accidents

Hazardous chemical spills

## Virtual Training Devices

Position trackers  
Haptic gloves  
Motion capture sensors



## Training Participants

Head-mounted displays (HMDs)



## Key Technologies

## 1. VR HMD

- Provides training using VR environments, enhancing immersion and allowing users to interact with location-based sensing systems.

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

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

## 3. Multi-Sensor Technology

- Utilizes sensors for temperature, smoke, motion, location, and position tracking to simulate realistic firefighting scenarios without requiring actual firefighting equipment.

## 4. Machine Learning and Big Data

- Enhances training scenarios through feedback-based learning systems, leveraging big data to provide insights and improve performance.

## 5. Communication Network and Synchronization Technology

- Supports large-scale team-based tactical training models, including a 3-stage response system.

## Related Technology

## Motion Capture System



- I Motion : Captures motion using transmission sensors.

- Sigma Optics : Supports simultaneous multi-connection and precise position tracking.

## Haptic Devices



- Sigma Glove : Provides vibration and temperature feedback, capturing movements of 10 fingers.

- Sigma Suit : Delivers low-frequency vibrations with 300 haptic feedback points.

- Sigma Control : Features a haptic controller for position and self-tracking.

## Technology Companies

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

**IPOP**  
www.ipopkorea.com

**RAON METADEMY**  
www.metademy.ac

**SKONEC**  
www.skonec.com

**ETRI**  
www.etri.re.kr

