VR/XR Training System for Disaster & Safety

A cutting-edge training solution that leverages spatial computing and scenariobased 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.



 \blacktriangle 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

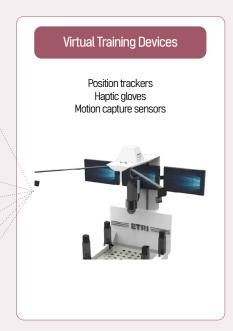
- The National Fire Agency began building a virtual fire training system in 2019 and is pursuing the creation of various complex spaces by 2025.
- The municipal government of Daejeon adopted digital twin-based immersive video content for fire training programs in September 2024 covering eight high-density 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







Key Technologies

1. VR HMD

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

2. M&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.



Delivers lowfrequency vibrations with 300 haptic feedback points.



Sigma Control: Features a haptic controller for position and selftracking.

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