

VRVis K1/Multi-Modal Environment
VRVis Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH

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Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH

VIRTUAL REALITY FIRE SAFETY TRAINING

FIRE PROTECTION TRAINING FOR NON-PROFESSIONALS IS EXPENSIVE, COMPLICATED AND DANGEROUS. THE SOLUTION: TRAINING IN VIRTUAL REALITY.

Fire safety training for non-professionals is expensive, complicated and dangerous. In Austria, preparatory training in the event of a fire is legally obligatory in a number of industries and prevents personal injury and damage to property in the event of an emergency. Virtual fire fighting is clearly superior to fire protection training in reality in terms of safety, practicability and selection of training scenarios. In particular, because for safety reasons the real training is actually carried out under very unrealistic conditions in order to avoid risk and damage.

In our Virtual Reality fire protection training, the handling of a fire extinguisher and the behavior in the event of a fire is trained. Virtual fire fighting is clearly superior to fire training in a real environment in terms of safety, practicability and selection of training scenarios. The goal of this VR application is to offer a

playful training with sustainable learning success. The most important learning aspects are the correct handling and application of the different fire extinguishers (water and foam), as well as a better assessment of the dangerous situations and the learning of correct extinguishing techniques. The various fire scenarios can be selected via an intuitive, very minimalist and therefore easy-to-use menu interface.

For the immersive perception of the training scenarios the HTC Vive - a Virtual Reality eye-wear - is used. The software is developed with the rendering engine "Unity". The learning process is based on a real, guided training. The student who perceives the virtual scene can be guided through the training by a trainer. The virtual fire and smoke growth is implemented by an approximated physical system.

SUCCESS STORY

Safe and yet realistic

Users learn how to behave in the event of a fire in a room: they have to decide in real time which fire extinguisher is suitable for which situation. The two different fire extinguishers are operated with the motion controllers (Fig. 1). After each extinguishing process, there is feedback as to whether the fire was handled correctly. Worst case scenarios (e.g. the entire kitchen burns down) can also be played through with-out having to experience the danger of a real fire. The fatal consequences of wrong behavior in the event of a fire, or what unsuccessful extinguishing looks like, can be learned very clearly by users when the simulated fire spreads in real time and devours the VR living room.

For the right training effect, several scenarios were developed: for example, burning fat in a pan in a kitchen, a burning curtain or burning electronic devices in the living room.

The advantage of Virtual Reality fire protection training is that it enables realistic but completely safe

training without personal injury or material damage. The users can train the correct behavior in case of fire, the correct handling of different fire extinguishers and different fire sources as well as fire types and efficient fire extinguishing in one. Users can also repeat the scenarios as often as they wish - until the desired learning effect sets in and they are familiar with the correct fire protection behavior. If hardware (standard HTC Vive) is available, it is also possible to complete such a training remotely (regardless of time and location).



Fig. 1: The user operates the fire extinguishers with the movement controllers to extinguish the fire. © VRVis

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