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oKat-SIM – An Interdisciplinary Research Project to Optimize Natural Disaster Management Using Augmented Reality

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In the event of a natural disaster, local authorities often have to rely on limited experience and sporadic training to make important and lifesaving decisions. This increases the stress levels of the workforce involved in the response effort and can result in an inaccurate assessment of the situation with potentially catastrophic consequences. oKat-SIM aims to support local administrative offices in natural disaster situations by providing augmented reality (AR)-based training to public authorities in order to increase geohazard awareness and improve associated responses. Our initial focus is on possible flood and landslide scenarios in three different regions of Germany: the lowlands of Görlitz, urbanized Leverkusen, and the mountainous Garmisch-Partenkirchen region. These scenarios are based on state-of-the-art modelling of realistic, cascading natural disaster events and incorporate environmental parameters such as precipitation, high-resolution topography, and examples from past events. Together with local partners, we are developing training simulations adapted to the threats posed by natural disasters in each of the study areas. We use the Unity game engine to translate GIS-based data and modeling results into the AR simulation environment. AR training immerses the participants in realistic states of emergency while maintaining direct communications, which results in safer and more rapid decision making that will ultimately protect communities from natural disasters. The success of the training will be evaluated by cognitive science methods including measuring the learning effect under different stress levels. These measurements will be used to modify the training environment to achieve optimal learning results.