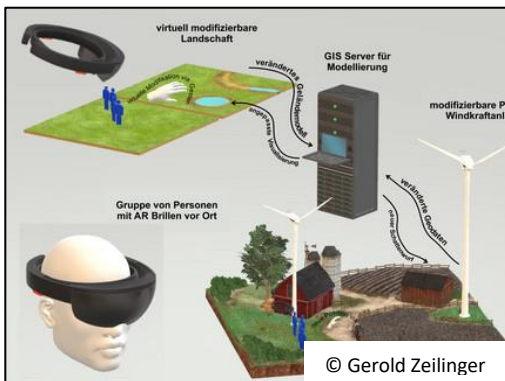


Geological GIS Analysis and 3D Visualization

Description



What was previously represented on many individual map sheets is now brought together in a three-dimensional image. This integration allows for a better understanding of the often complex relationships underground and on the surface. Effective communication with and within society is of particular importance. Conveying research results and their potential impacts to relevant stakeholders in politics, business, and the public is crucial for forming opinions and gaining acceptance for necessary measures.

Augmented Reality (AR) enables the visualization of realistic on-site situations and the overlay of landscape changes in the real environment, ensuring continued direct eye contact and non-verbal communication between users, unlike Virtual Reality (VR).

Details

The research activities of the General Geology working group combine studies of tectonics, climate, and surface processes across different timescales with the overarching goal of gaining a better understanding of these complex interacting processes that shape our planet and our habitat. In this context, the topics of geological GIS analyses and 3D visualization mentioned here provide a comprehensible picture when combined. Selected projects focus on the simulation and analysis of disaster scenarios and the visualization of landscape changes using Augmented Reality (AR) in a real environment. The purpose of both projects is to utilize knowledge of geological processes through AR GIS data in professional training for disaster prevention and civil security, as well as to enhance public participation in these projects.

Offers for research co-operation, contract research and industry-supported research:

1. Support in the visualizing and analyzing of geological data for better decision-making (e.g., geothermal energy).
2. Dreation of animations to illustrate geological processes and their effects.
3. Development and implementation of AR visualizations for training and decision support in crisis situations.

Special Equipment

- 3D visualisation lab with a 3-sided CAVE and GIS infrastructure
- 5 Microsoft HoloLens 2 headsets

The 3D CAVE at the Institute of Geosciences offers modern immersive visualization for fast and easy analysis of complex spatial and temporal multi-scale datasets. Based on nearly 10 years of experience, it enables smooth data/model transfer and immediate group work in the visualization cluster. The mobile AR headsets offer the advantage of overlaying the real environment with digital information, allowing users to visualize changes on-site or collaboratively discuss 3D situational representations.

Applications

- Augmented Reality
- GIS analysis
- 3D Visualization
- Natural Hazard Models

Keywords

- Knowledge Transfer
- Disaster Protection
- Planning

Interest in cooperation

- Research-based collaboration
- Contract research
- Industry-sponsored research

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