Geolokit3D: A Unity-Based Plugin for Interactive Geological 3D Model Exploration and Measurement

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Résumé

The increasing accessibility of advanced game engines such as Unity has revolutionized geoscience education by providing immersive, interactive, and intuitive 3D environments. Here, we present Geolokit3D, a Unity-based plugin designed to facilitate hands-on geological exploration and measurement within virtual 3D models. Geolokit3D allows users to navigate through complex geological structures using a gyroscopic PlayStation controller, and interact with contextual elements such as a nadir MiniMap and in-app help resources.
Designed primarily for teaching but also suitable for research, Geolokit3D provides a range of essential tools: users can measure distances and azimuths with a two-point tool and perform structural geology measurements (strike and dip) of planar features. The plugin also supports dynamic texture switching, allowing seamless toggling between satellite imagery, hyperspectral data, geological maps, and other overlays for comprehensive analysis.
At the University of Lyon (France) and through our geosciences cursus (https://lyongeologie.fr/), Geolokit3D can be deployed across multiple visualization platforms: the IglooLab-a 6-meter-wide 360◦ cylindrical projection system accommodating 12 students; a multi-user virtual lab for up to 10 synchronous VR participants; and traditional flatscreen displays. This flexibility makes Geolokit3D a valuable tool for collaborative teaching, virtual fieldwork, outreach and geoscience research for teachers, students, and researchers.

Mots-Clés: Unity, Geoteaching, 3D models, IglooLab

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