

# 3D Virtual Geology Field Trips: Opportunities and Limitations

## Abstract

As a part of The OpenScience Laboratory, (<http://www.open.ac.uk/blogs/openscience/>), an initiative of The Open University (OU) and The Wolfson Foundation, we are developing a 3D simulation of a Geology field trip based around Skiddaw in the Lake District, using the Unity 3D software (<http://unity3d.com/>). We are using digital data and imagery to reconstruct the landscape faithfully enough to provide a real sense of presence for the user. The application will be based around a 10km x 10km low/medium detail model of the terrain and LiDAR data around Skiddaw, with overlaid aerial photography, and including walls, trees, buildings etc. The Skiddaw field trip in the Lake District is an integral part of Earth science teaching at the OU; students carry out a real field trip and can also learn about it through DVD activities.

The primary objective of developing an authentic 3D interactive simulation has been to provide an immersive experience to the users through sense of space. The virtual embodiment in the form of avatars and the multi-user environment will help give a sense of co-presence and provide opportunities for collaborative learning. The interactions and the learning activities within the 3D environment are designed to mirror the experience of a real field trip.

We now have an operational 3D virtual geology trip (April 2013). In our research, we are addressing the following: comparison of the 3D experience with 2D virtual field trips; the role that a 3D virtual geology field trip can play in terms of preparation and reflection before and after a real field trip; and whether and how a 3D simulation helps in gaining geological fieldwork skills and what are the limitations of 3D virtual geology field trips.

The two videos are at these locations:

Video 1: <[http://youtu.be/5\\_h4Nl3AvCY](http://youtu.be/5_h4Nl3AvCY)>

Video 2: <<http://youtu.be/MOdu5jQukUk>>

## Keywords

3D virtual geology field trips; 3D simulations of field trips; avatar-based interactions; geological fieldwork; immersive experience; virtual field trips.

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