

# Open Research Online

---

The Open University's repository of research publications and other research outputs

## 3D virtual geology field trips: opportunities and limitations

### Conference or Workshop Item

How to cite:

Argles, Tom; Richardson, Brian; Davies, Sarah; Minocha, Shailey and Braithwaite, Nick (2013). 3D virtual geology field trips: opportunities and limitations. In: HEA STEM: Annual Learning and Teaching Conference 2013: Where practice and pedagogy meet, 17-18 Apr 2013, Birmingham.

For guidance on citations see [FAQs](#).

© 2013 Not known

Version: Version of Record

Link(s) to article on publisher's website:

[http://www.heacademy.ac.uk/events/detail/2012/17\\_18\\_Apr\\_HEA\\_STEM\\_2013\\_Conf\\_Bham](http://www.heacademy.ac.uk/events/detail/2012/17_18_Apr_HEA_STEM_2013_Conf_Bham)

---

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's data [policy](#) on reuse of materials please consult the policies page.

---

[oro.open.ac.uk](http://oro.open.ac.uk)

# 3D Virtual Geology Field Trips: Opportunities and Limitations

## Tom Argles

Department of Environment,  
Earth & Ecosystems  
The Open University  
Milton Keynes MK7 6AA, UK  
tom.argles@open.ac.uk  
[www.open.ac.uk/openscience](http://www.open.ac.uk/openscience)

## Brian Richardson

Faculty of Science  
The Open University  
Milton Keynes MK7 6AA, UK  
brian.richardson@open.ac.uk  
[www.open.ac.uk/openscience](http://www.open.ac.uk/openscience)

## Sarah Davies

Department of Environment,  
Earth & Ecosystems  
The Open University  
Milton Keynes MK7 6AA, UK  
sarah.davies@open.ac.uk  
[www.open.ac.uk/openscience](http://www.open.ac.uk/openscience)

## Shailey Minocha

Centre for Research in  
Computing  
The Open University  
Milton Keynes MK7 6AA, UK  
s.minocha@open.ac.uk  
[www.open.ac.uk/openscience](http://www.open.ac.uk/openscience)

## Nick Braithwaite

Department of Physical Sciences  
The Open University  
Milton Keynes MK7 6AA, UK  
n.s.braithwaite@open.ac.uk  
[www.open.ac.uk/openscience](http://www.open.ac.uk/openscience)

## 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 aim to have an operational 3D virtual geology trip by the time of the Conference in April 2013. During the workshop and through demonstration of the 3D field trip, we plan to address: 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.

### **Keywords**

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

### **Plans for participants**

During the workshop, after the demonstration and a short presentation of the 3D virtual Geology field trip of Skiddaw, we will invite participants to record their individual perceptions (e.g. through post-its) of the opportunities, challenges and limitations of 3D virtual geology field trips. These post-its will serve as a useful starting point for discussions around and beyond the following aspects: 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.