# A user interface for landscape modelling in a virtual environment using a head mounted display

Virtual landscapes are an important component in representing natural environments for applications such as computer games, film, simulation and training. With the recent increase in the availability and accessibility of head mounted displays (HMDs from now) to the public there is likely to be a demand for tools that allow developers to create landscapes for use with such devices. Therefore, we wish to allow landscape modelling to take place using the devices which the landscapes will be viewed with.

We propose to modify an existing landscape modelling desktop application for use with a HMD. We will modify the application interface such that existing tools will be usable in a HMD based virtual environment. We will then perform user based testing to ascertain the usability of the modified application in comparison to the desktop version.

There is existing research comparing the usability of software when used with traditional desktop interfaces to being used with HMDs. Of interest is research in navigating environments using traditional interfaces compared to HMDs and the use of Computer-Assisted Drawing software in HMD environments. Additionally, there are large bodies of research on both landscape modelling and user-based usability testing.

The existing landscape modelling application we intend to modify provides the user with several tools. The ability to add and modify geometric constraint points and curves to a landscape. Coherence controls allow users to fix parts of the landscape. Copy/paste functionality allowing landscape regions to be moved to new locations and elevations. Type constraints which can be painted onto the landscape. To interact with these tools users

have access to a combination of sketching, painting and 3D widget interface elements.

The modified application will need to provide these tools as well as incorporating interface elements designed to work with a HMD. Additionally, it is likely that new tools or features will need to be added to provide sufficient usability in a virtual environment designed for a HMD.

Once the development of the modified application has progressed to the point of a working prototype we will carry out user-based usability testing. This will involve comparing the Desktop system to the HMD system using standard usability measures. Test participants will be drawn from students, preferably those with experience using 3D virtual environment tools such as Unity or other game engines.

We will then draw conclusions based on these tests as to whether we have successfully translated the desktop application into an HMD environment.

This work will reflect on whether we can successfully transfer certain desktop applications into a HMD environment effectively. Additionally, we will be able to observe which tasks translate well across environments and which do not as well as which interface elements are effective in a HMD environment.