Beacon Island virtual environment

Paul Bourke, March 2015

Building models: Aaron Cross

Unity3D implementation: Paul Bourke (alpha version), Nick Oliver (Current)

The following is a brief description, manual and some technical information for the Beacon Island navigable virtual environment. The version presented here is based upon the assets collected during the 2013 and 2014 trips to the island by the author. The goal of this stage of the project is to capture the island as it was before the fisherman huts were removed.

The virtual island includes the following assets:

- 3D models of all of the buildings on the Island before their removal. These are based upon measured floor plans for most buildings, a couple of buildings are missing interior walls due to limited access.
- Textures on the exterior of the building models are largely based upon actual photographs, for example, windows, door, paint, concrete and paneling.
- 3D models of many of the other structural elements on the Island such as wind vane, toilet block, coral walls, water tanks and so on.
- Photographic bubbles from the interior of the majority of building rooms.
- 3D objects reconstructed from photographs, such as the cairn and coral building.

- Models of the 3 jetties on the island based upon their appearance in 2013.
- Bird and water sounds recorded from the Island. Seagulls fly randomly above the Island.
- Exterior photographic models from various locations on the island.
- A sky/environment map captured from the Island.
- Long (seal) Island terrain and selected photographic bubbles.

The environment is built upon the Unity game engine and has been exported for Apple Mac and Windows operating systems. It should be noted that it is not designed to be able to necessarily run well on all machines but rather better than average computers.

Launching the application presents the usual Unity game dialog. This allows one to choose the window size, the graphics quality (this translates into performance), and to inspect the input keyboard mappings. For the first time it is proposed that the application is run in Windowed mode and either "Performance" or "Balanced" quality.
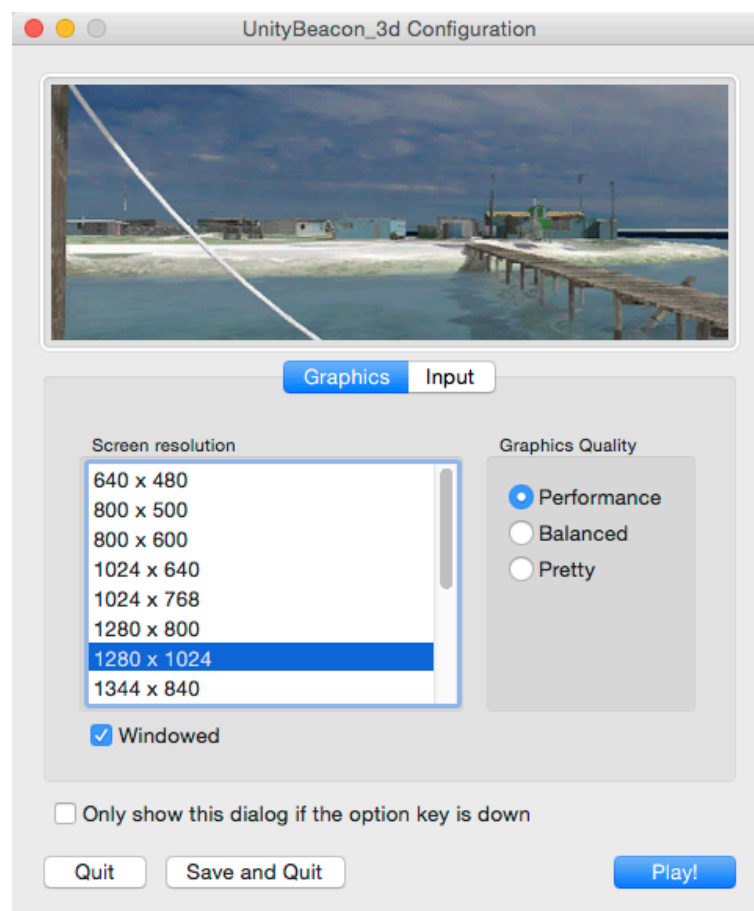

Introductory options window

Some of the more commonly used controls are as follows.

Mouse	Controls the direction the virtual camera is pointing.
Arrow keys	Same as the mouse, the author prefers this mode.
w, d keys	Move forward or backwards
a, d keys	Pan left or right
Shift key	Moves faster

Tab key	Toggles between walking on the surface of the island and flying. In flying mode one is moving in the direction the virtual camera is pointing, so to fly higher one can look up and move forward (w), or look down and move backwards (s).
Control, space	Change elevation in flying mode.
h key	Presents a further help window which includes options to change the quality, navigation speed and reset the virtual camera to the main jetty.
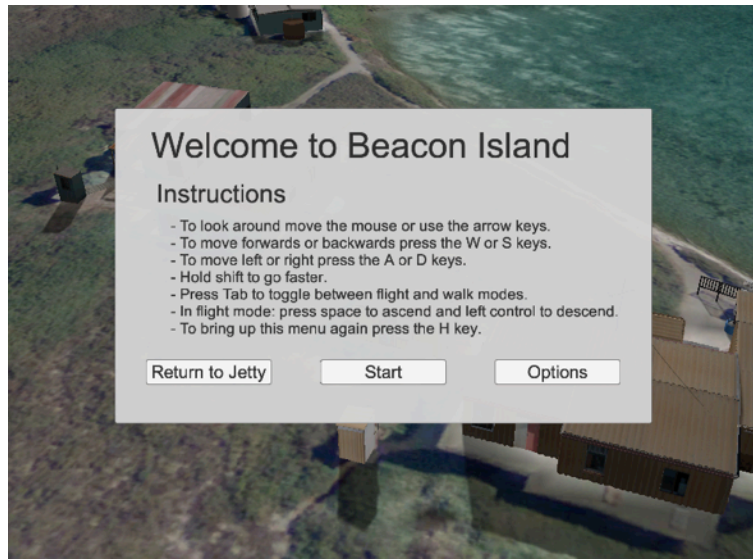
Help screen, appears when the "h" key is pressed

Main jetty entry point

Photographic bubbles are scattered over the island and within buildings. As one gets close to the bubble navigational control will move the camera to the center from which the 360 photographic (real) environment can be experienced. This is the only way the interiors of the buildings can be experienced since they are far too geometrically complicated to ever be modeled in 3D.

Outside and inside a bubble

Long Island

The project has been tested on "above average" Apple Mac and Windows laptops. Apple Mac Pro and various Windows workstations. While not implemented in this release the following have been evaluated in previous test versions: Oculus Rift, iDome. Testing has also been performed on various tiled displays however they require a slower navigation step size before they would be considered usable.