



Visualizing Archaeology with Digital Reconstruction

Overview

- Visualising Archaeology goals and examples
- Issues in digitising archaeology
- Digital modelling and architectural reconstruction
- Artefact digitisation, reconstruction and placement
- Exploration and interaction
- Creating Characters
- Communication and dissemination
- Resources

Archaeology

the study of human history and prehistory through the excavation of sites and the analysis of artefacts and other physical remains.

- Remains
- Artefacts
- Buildings



Visualising Archaeology

Examples

- Prisoner of War Camp – Highlanders museum
- St Andrews Cathedral
- Iron Age Roundhouse
- St Madoes Stone
- Perth 1540
- Callanish landscape



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- Visualising Archaeology goals and examples
- **Issues, guidelines and best practice**
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Issues, Guidelines and Best practice

- London Charter
- Seville Principles



London Charter 2006

- Charter for the computer-based visualisation of cultural heritage.
- Focus on being transparent about the evidence behind a reconstruction.
- <http://www.londoncharter.org/>



Seville Principles 2011

- International principles of virtual archaeology.
- Builds on the proposals in the London Charter.
- <http://smartheritage.com/seville-principles/seville-principles>



Interdisciplinarity

Among the experts ... it is essential to ensure the specific presence of archaeologists and historians, preferably those who are or were responsible for the scientific management of the excavation work or archaeological remains to be reconstructed.

Purpose

Any proposed computer-based visualisation will always aim to improve aspects related to the research, conservation or dissemination of archaeological heritage. The overall aim of the project must be encompassed within one of these categories

- 1) research
- 2) conservation
- 3) dissemination

The category concerning dissemination includes both educational projects, whether formal or informal education, and recreational projects (cultural tourism)

Complementarity

The application of computer-based visualisation for the comprehensive management of archaeological heritage must be treated as a complementary and not alternative tool to other more traditional but equally effective management instruments.

Computer-based visualisation should seek forms of collaboration with other methods and techniques of a different nature to help improve current archaeological heritage research, conservation and dissemination processes. To do so, compliance with “Principle 1: Interdisciplinarity” will be fundamental.

Nevertheless, computer-based visualisations might be an alternative approach when original archaeological remains have been destroyed (e.g. due to the construction of large infrastructures), are placed in areas with difficult accessibility (e.g. without roads) or at risk of deterioration due to the huge influx of tourists (e.g. rock paintings).

Authenticity

Computer-based visualisation normally reconstructs or recreates historical buildings, artifacts and environments as we believe they were in the past. For that reason, it should always be possible to distinguish what is real, genuine or authentic from what is not. In this sense, authenticity must be a permanent operational concept in any virtual archaeology project.

Historical Rigour

To achieve optimum levels of historical rigour and veracity, any form of computer-based visualisation of the past must be supported by solid research, and historical and archaeological documentation.

The historical rigour of any computer-based visualisation of the past will depend on both

- a) the rigour with which prior archaeological research has been performed
- b) the rigour with which that information is used to create the virtual model.

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Architectural Reconstruction

- Gather **all** available evidence
- **Archaeological Evidence**
- Maps
- Scale plans and elevations
- Look at Comparisons sites
- Photos and illustration
- Written evidence



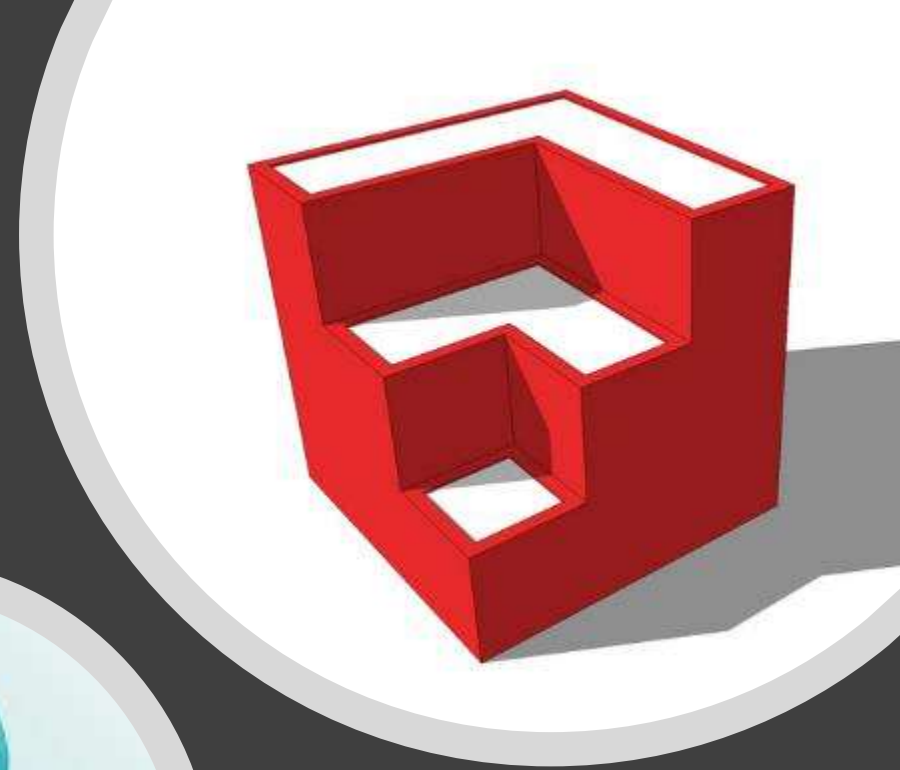
Architectural Reconstruction

- Archaeological evidence can be transformed into virtual landscape and structures and built upon to create a better understanding of the past and better visualise sites for education and further research.



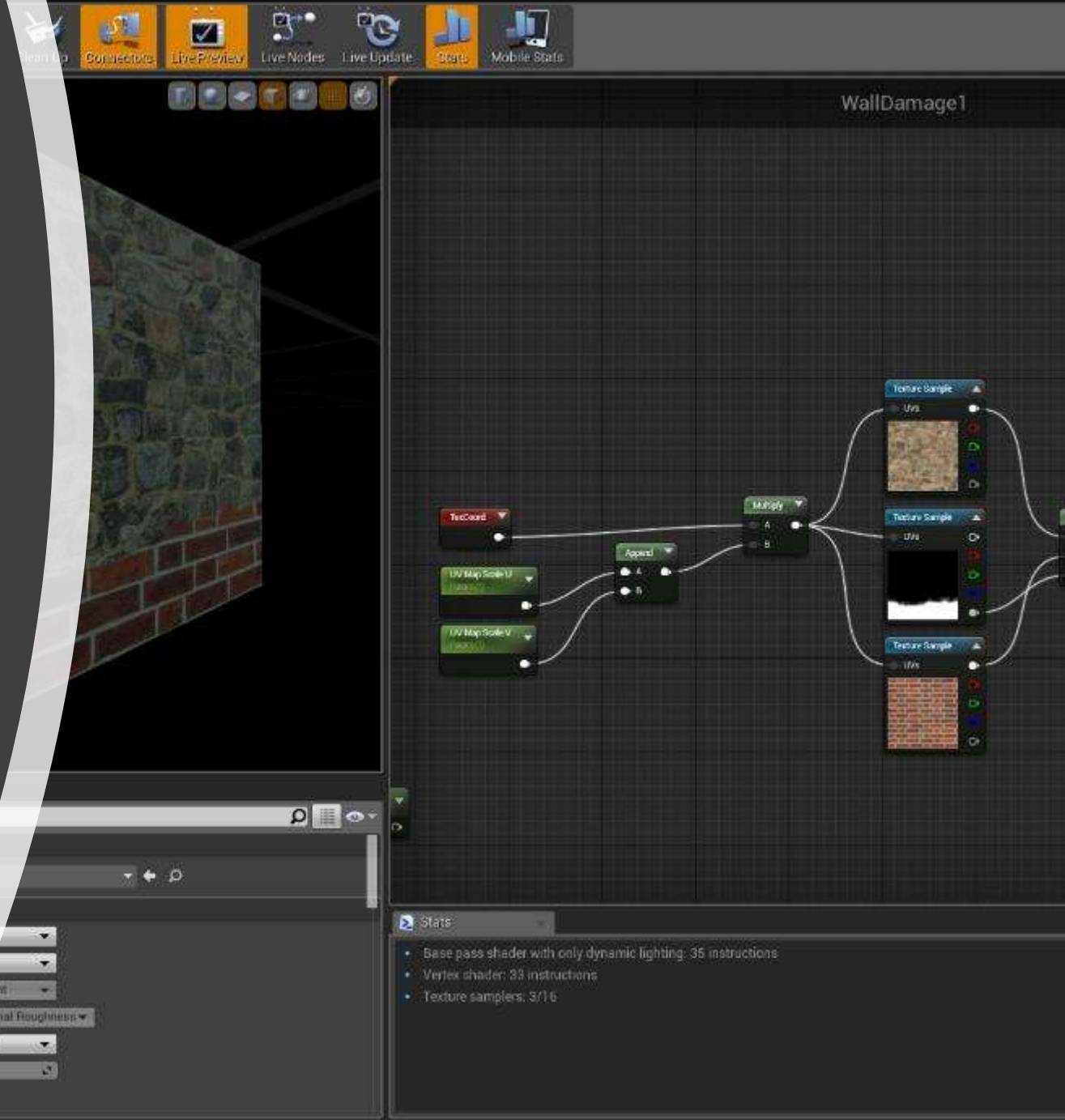
Mesh Creation

- **Software Examples**
- Blender
- SketchUp
- 3ds MAX



Materials and Textures

- UV Mapping
- A **UV map** is the flat representation of the surface of a 3D model used to easily wrap textures. The process of creating a **UV map** is called **UV unwrapping**. The U and V refer to the horizontal and vertical axes of the 2D space, as X, Y and Z are already being used in the 3D space.
- This can be done in **Blender**, **Unreal Engine 4** or **Autodesk MAYA**, **Substance Paint**





Workflow Example

- **Import .fbx files to Unreal Engine 4**
 - FBX is a file format owned and developed by Autodesk. It is used to provide interoperability between digital content creation applications such as MotionBuilder, Maya, 3ds Max, SketchUp and Blender.
 - Unreal Engine features an FBX import pipeline which allows simple transfer of content from any number of digital content creation applications that support the format.
 - The advantages of the Unreal FBX Importer over other importing methods are:
 - Static Mesh, Skeletal Mesh, animation, and morph targets in a single file format.
 - Multiple assets/content can be contained in a single file.
 - Import of multiple LODs and Morphs/Blendshapes in one import operation.
 - Materials and textures imported with and applied to meshes.



Development phases

1. Create simple accurately scaled models.
2. Add items to interiors, placeholder characters.
- 3 Materials and textures.
4. Develop interaction system, add interactions to objects, information panes, integrate dialogue system.
5. Polish existing assets (recreate/improve).
6. Create multi-camera setup, produce video, produce photospheres.

Asset lifecycle

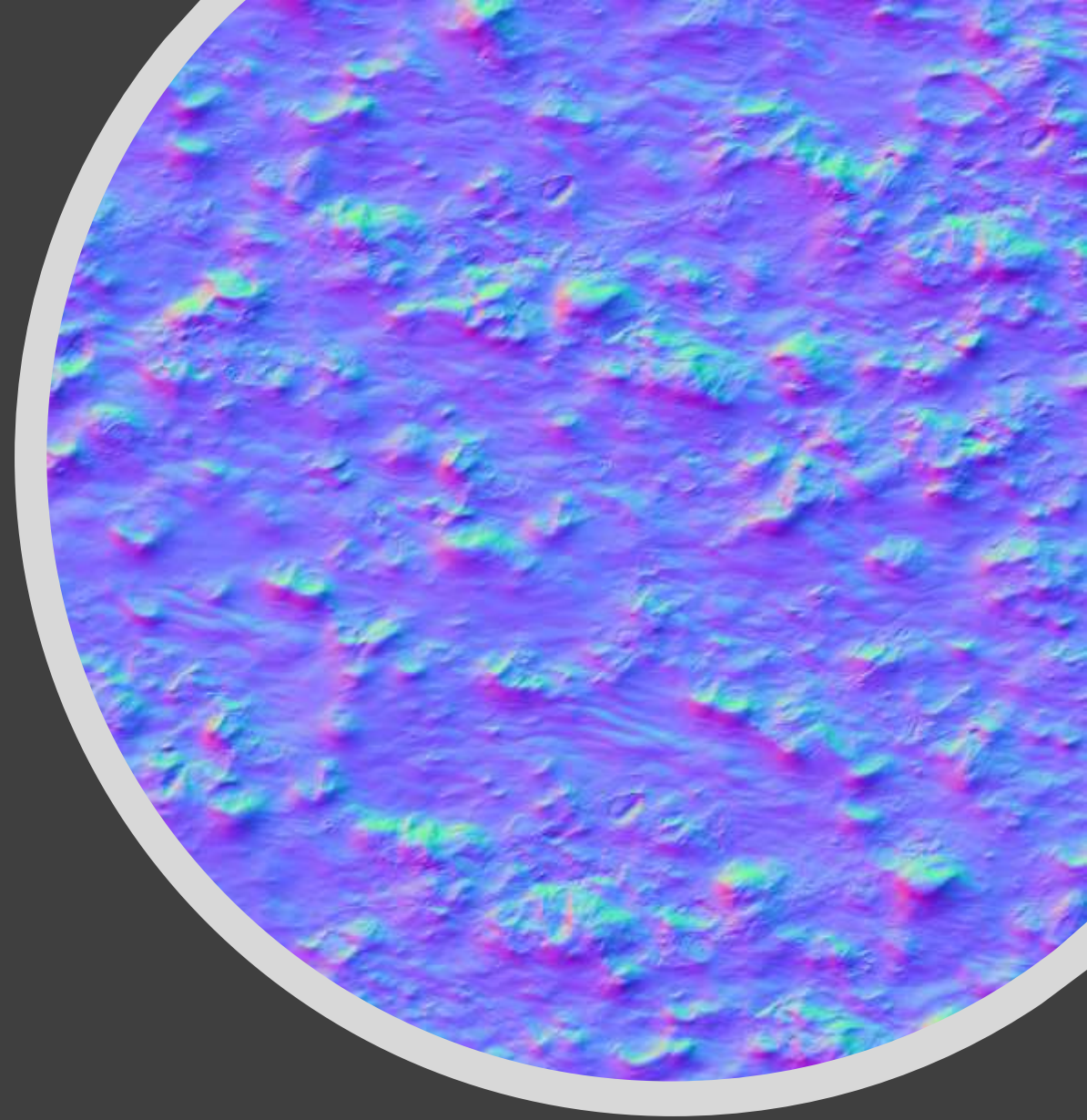
EVIDENCE

CREATION OF ASSETS

MATERIALS & TEXTURE

CHARACTERS & ANIMATION

ASSETS INTO GAME ENGINE



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The Illicit Still *Experience*





DIVE INTO VIRTUAL REALITY...
THE FOLLOWING STEPS WILL HELP YOU GET STARTED WITH VR.

STEP 1 Choose your VR headset. There are two main types of VR headset: standalone and PC-powered. Standalone headsets are more expensive but offer more freedom of movement. PC-powered headsets are less expensive but require a powerful computer.	STEP 2 Set up your VR headset. Follow the instructions in the manual to set up your headset. Make sure it is properly calibrated and that you are wearing it correctly.	STEP 3 Install the VR software. Download and install the VR software on your computer or mobile device. Make sure you have enough free space on your storage device.	STEP 4 Adjust the settings. Go into the settings menu and adjust the resolution, frame rate, and other settings to match your system's capabilities.	STEP 5 Start playing! Once everything is set up, you can start playing VR games or watching VR videos. Start with something simple and gradually work your way up to more challenging experiences.
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The Illicit Whisky Story

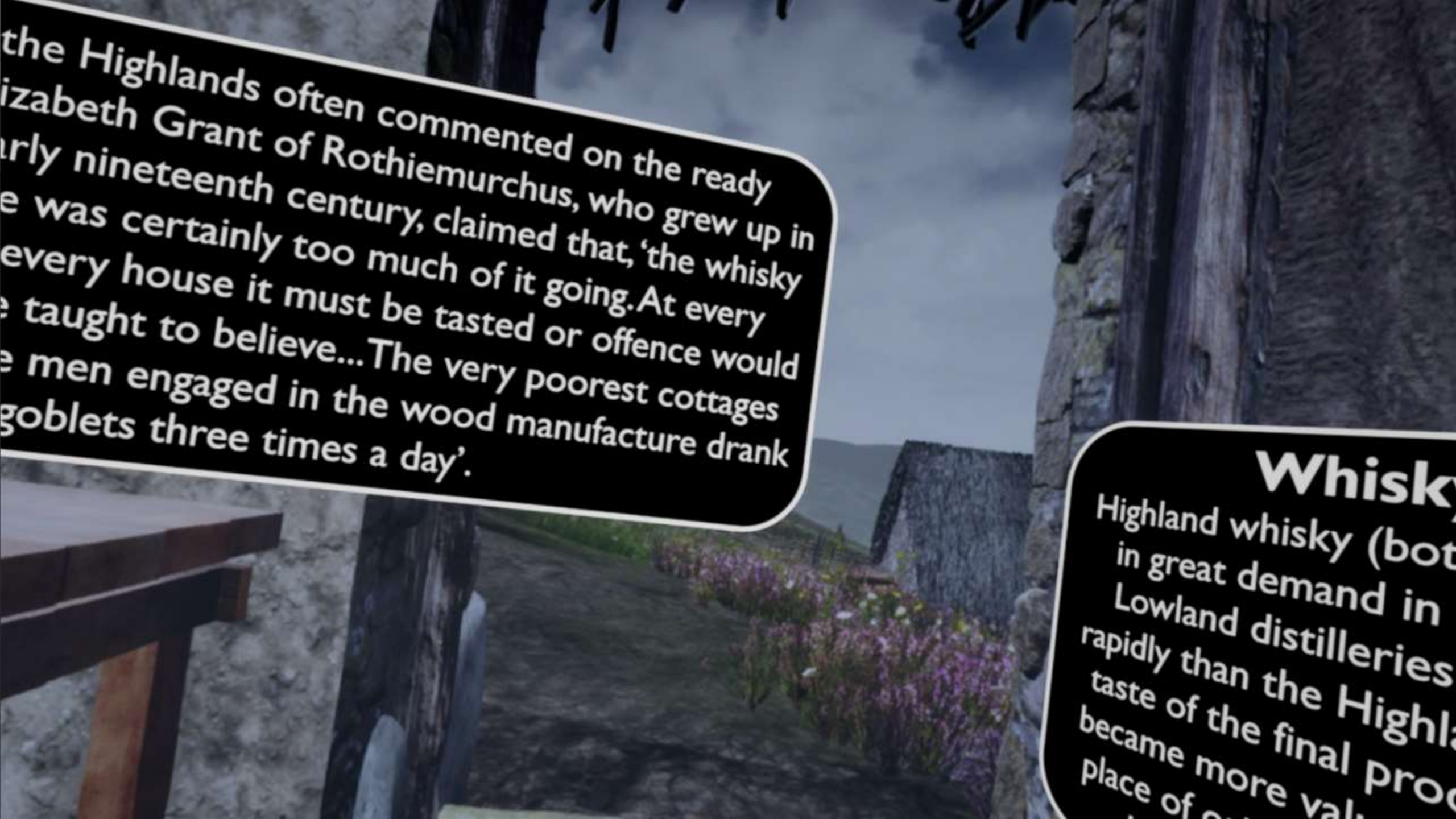


Tomintoul & Glenlivet Today



The Illicit Whisky Tour





the Highlands often commented on the ready Elizabeth Grant of Rothiemurchus, who grew up in the early nineteenth century, claimed that, 'the whisky was certainly too much of it going. At every house it must be tasted or offence would be taught to believe... The very poorest cottages the men engaged in the wood manufacture drank goblets three times a day'.

Whisky

Highland whisky (both in great demand in Lowland distilleries rapidly than the Highland taste of the final product became more valuable place of origin).



Next

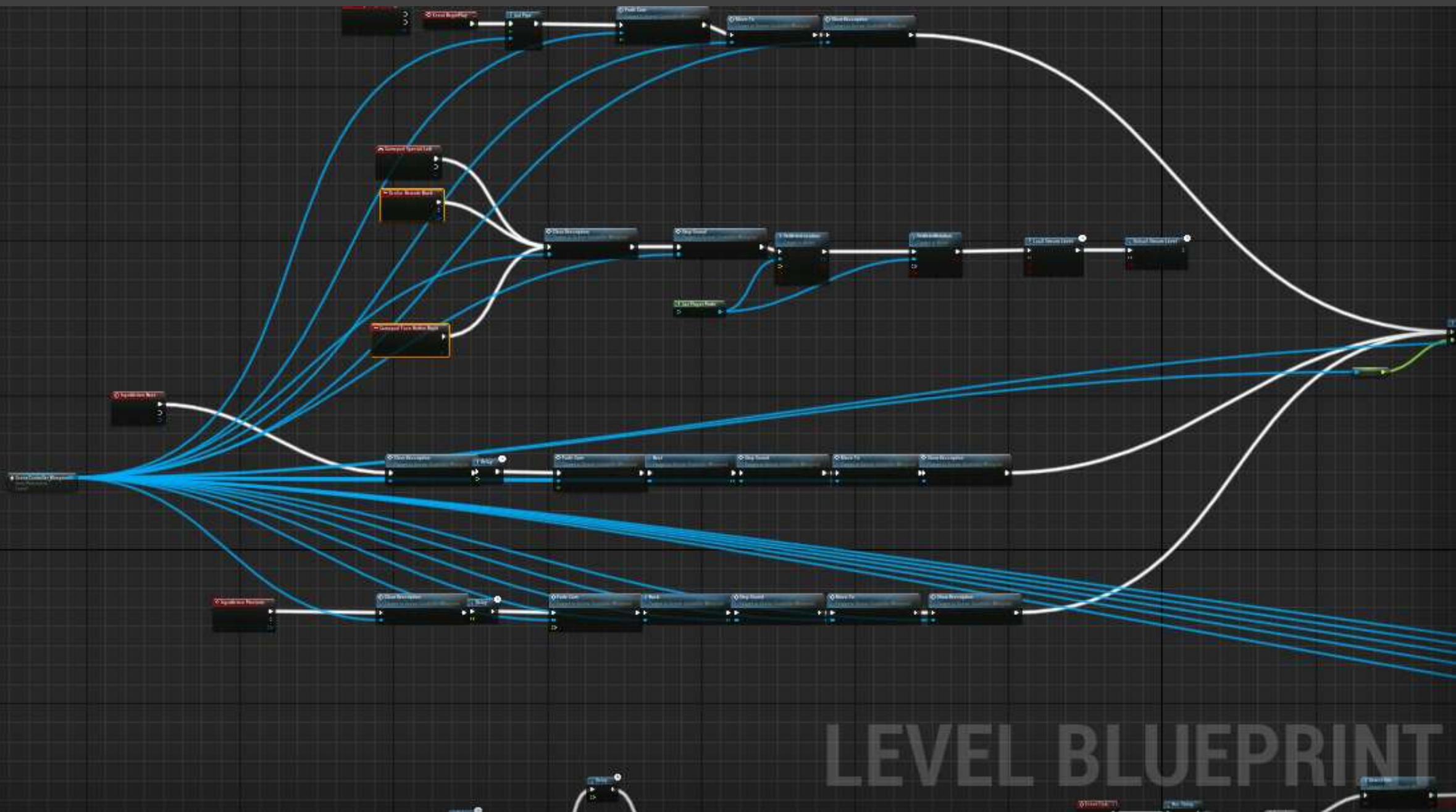
Walk Around

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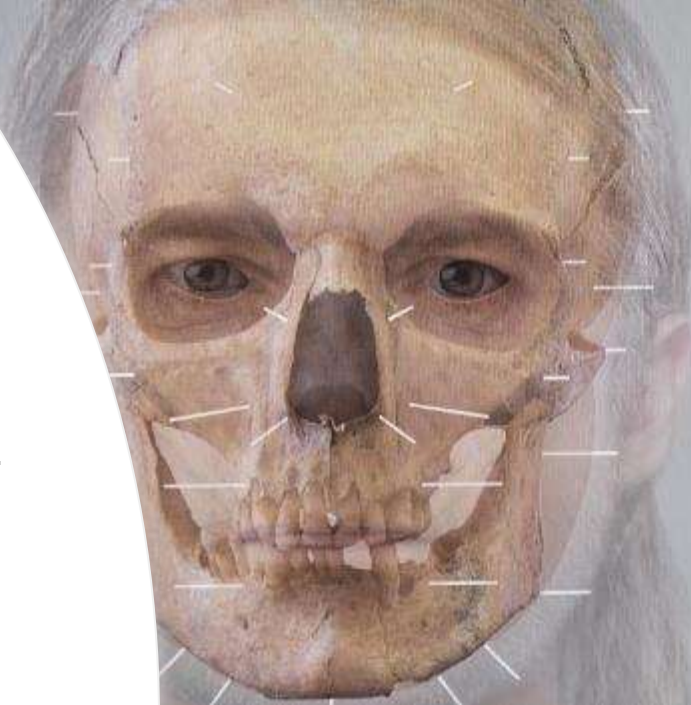
Creating Characters

- Characters add life to a virtual scene
- Animation can help tell a story



Creating Unique Characters

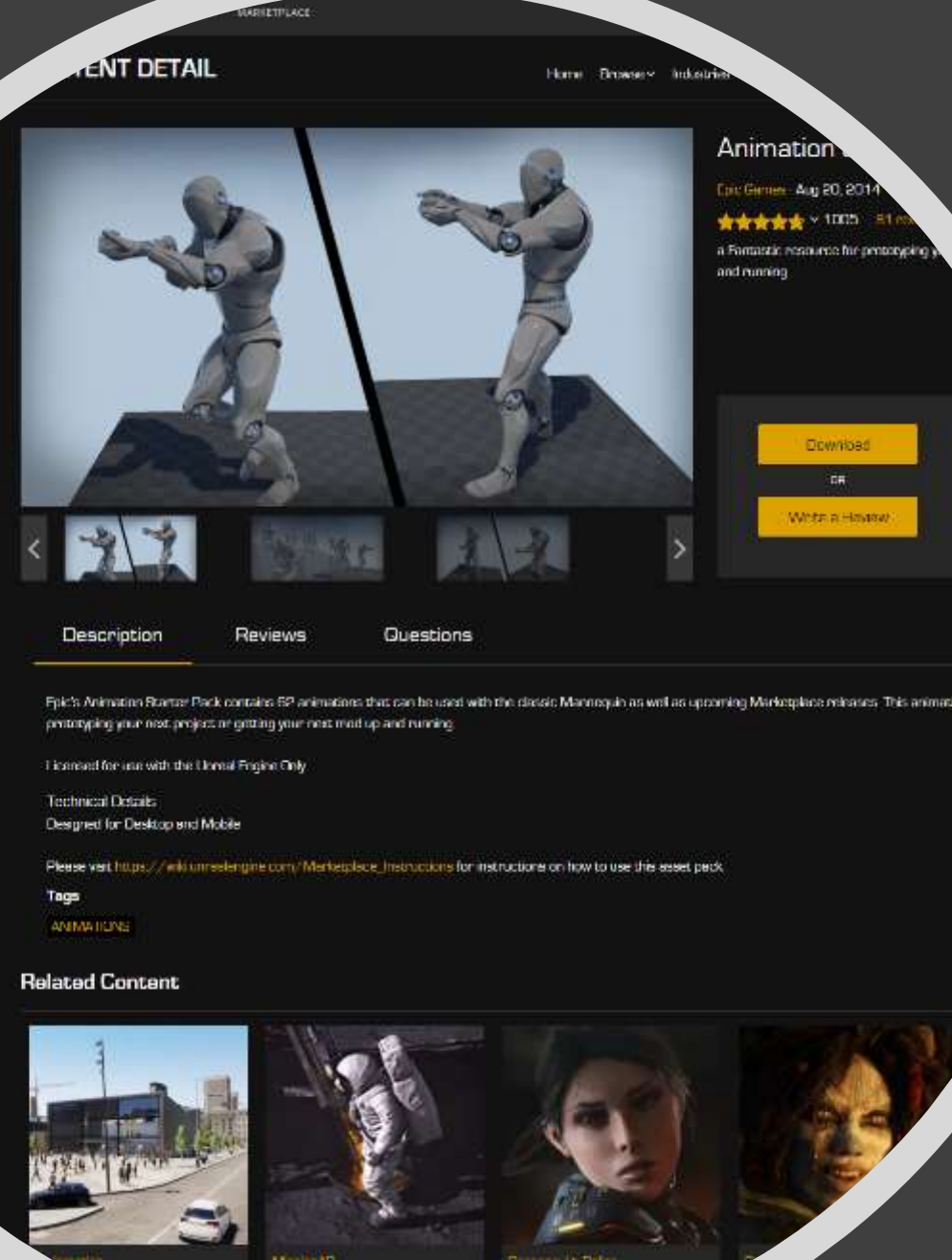
- Archaeological evidence can also provide us with an insight into lifestyle of people living on a site.
- Textiles
- Human remains
- Pottery
- Trade



Forensic artist Hayley Fisher



Animation starter Packs



Modular Packs




Character Kits

DETAIL

Home Browse Industries Free On Sale Vault Help

Search Products



Modular slot system






Texture variations

Facial expressions

Accessories

STYLIZED CHARACTER KIT

Casual Male 01



ROCKETARTS - Jun 9, 2020

★★★★★ ~ 44 44 reviews written | 17 of 18 questions answered

Modular stylized male character. Contains hairstyles, accessories, and several body parts options.

Free

or

Add to Cart

Supported Platforms

Supported Engine Versions

4.25

Download Type

Asset Pack

Description

Reviews

Questions

**100% Stylized character kits. Characters modular parts are interchangeable and compatible among different assets*

[Video demonstration](#)

UPDATE 1.01 [June 16 2020]: Changed File naming conventions, now they match with Casual 02 file names. Scene documentation updated correspondingly.

UPDATE 1.02 [June 24 2020]: Added ID and O_ID (diffuse ID - base grayscale texture) textures to the head mesh.

Modular character kit, containing several options for the torso, legs, and head accessories. Contains the naked body. Head includes morph targets for several facial expressions: Joy, Anger, Fear, Disgust, Sadness, Eyebink, Surprise.

This pack is designed to be compatible with my other packs yet to be released, so basic structure elements could be mixed up with other characters. The model divided into the following slots: Head, Head Accessory, Torso, Arms, Legs

Technical Details

Rigged: Yes

Rigged to Epic skeleton: Yes

If rigged to the Epic skeleton, IK bones are included: No

Animated: No

Number of characters: Characters are split in parts, 11 meshes in total (Head, Head Accessory, Torso, Legs, Arms). Contains 3 pre-constructed characters.

Vertex counts of characters: 23000 - 31000

Number of Materials and Material Instances: 45

Number of Textures: 95

Texture Resolutions: 2048x2048, 1024x1024

Supported Development Platforms:

Windows: Yes

Mac: Yes

Documentation: Migrate the assets to your current project and assign Epic Mannequin skeleton to them.

Tags

Communication and dissemination

- Museum Exhibit
- Image gallery
- Spherical images
- Virtual Tour
- Video
- Web exploration
- Steam exploration
- Twitch streaming
- Exhibitions
- Conferences
- Press
- Radio
- TV
- Social Media

Create
interest in
your project



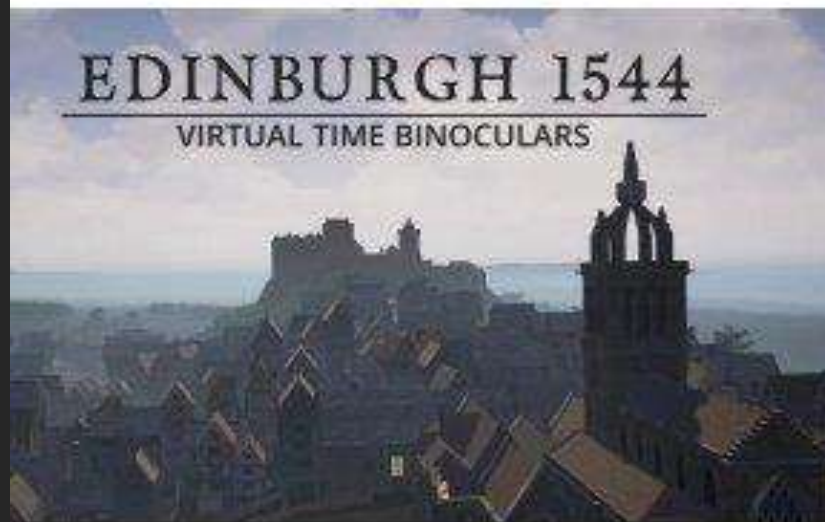
al Time Binoculars - Edinburgh 1544

Smart History 67.2K views



Edinburgh 1544 Townscape

SH Smart History 42.2K views



burgh 1544 - Location Compilation

Smart History 3,555 views



Grassmarket - Edinburgh 1544

SH Smart History 1,774 views

2019 by Perth and Kinross Community Projects organised by Perth and Kinross Heritage Trust.

The project has been credited with piecing together the everyday life of the Picts with its findings used to inform the digital reconstruction.



The lost Pictish settlement at Lair, Glen Shee, has been reconstructed in virtual reality to extraordinary effect. Reconstruction by Jack Horsburgh, still image courtesy of Perth and Kinross Heritage Trust. Copyright: Other 3rd Party

Publicity



[Read More](#)

The Picts: How their mysterious world is being illuminated like never before

David Strachan, director of Perth and Kinross Heritage Trust, said that people all over the world could now get an insight of this remarkable site.

He added: "The digital reconstruction in Virtual Reality of the sites excavated in Glen Shee really brings to life what otherwise are fairly technical plans and maps of the findings.



Most Popular



Test your knowledge: Can you name these 12 Edinburgh streets...

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Test your knowledge: Can you name these 12 Edinburgh landmar...

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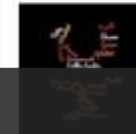
30 funny Scottish jokes: the most hilarious one-liners, puns...

[Heritage and Retro](#)



Hidden secret of the mummy in a Scottish museum...

[Heritage and Retro](#)



These are Scotland's 30 favourite words - how many do you kn...

[Heritage and Retro](#)



Exhibits

Demos

- Video showcase: <https://youtu.be/wRgbxX1lwsM>
- Interactivity Demo Video: <https://youtu.be/3pt5BGYwCvc>
- Roundme tour:
<https://roundme.com/tour/399204/view/1392126>
- Screenshots:
<https://photos.app.goo.gl/KpuvSFThMp3bXDdw7>
- Cineg listings:
 - <https://cineg.org/galleries/layergallery.php?title=Layer&id=18>
 - Cineg map: <https://cineg.org/map/?mapid=5>

Communicating Archaeology

- Demonstrate the use of images to effectively communicate archaeological concepts
- Use social media to disseminate archaeological concepts
- Create basic maps
- Assess various audiences for archaeological communication
- Use digital media to communicate archaeology



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Resources - Research

- Canmore - canmore.org.uk
- National Library of Scotland - nls.uk/digital-resources
- Your friendly Archaeologists and Historians



Digital gallery

View digitised items from our collections



eResources

Access thousands of books, journals, and databases



Map images

View thousands of maps online

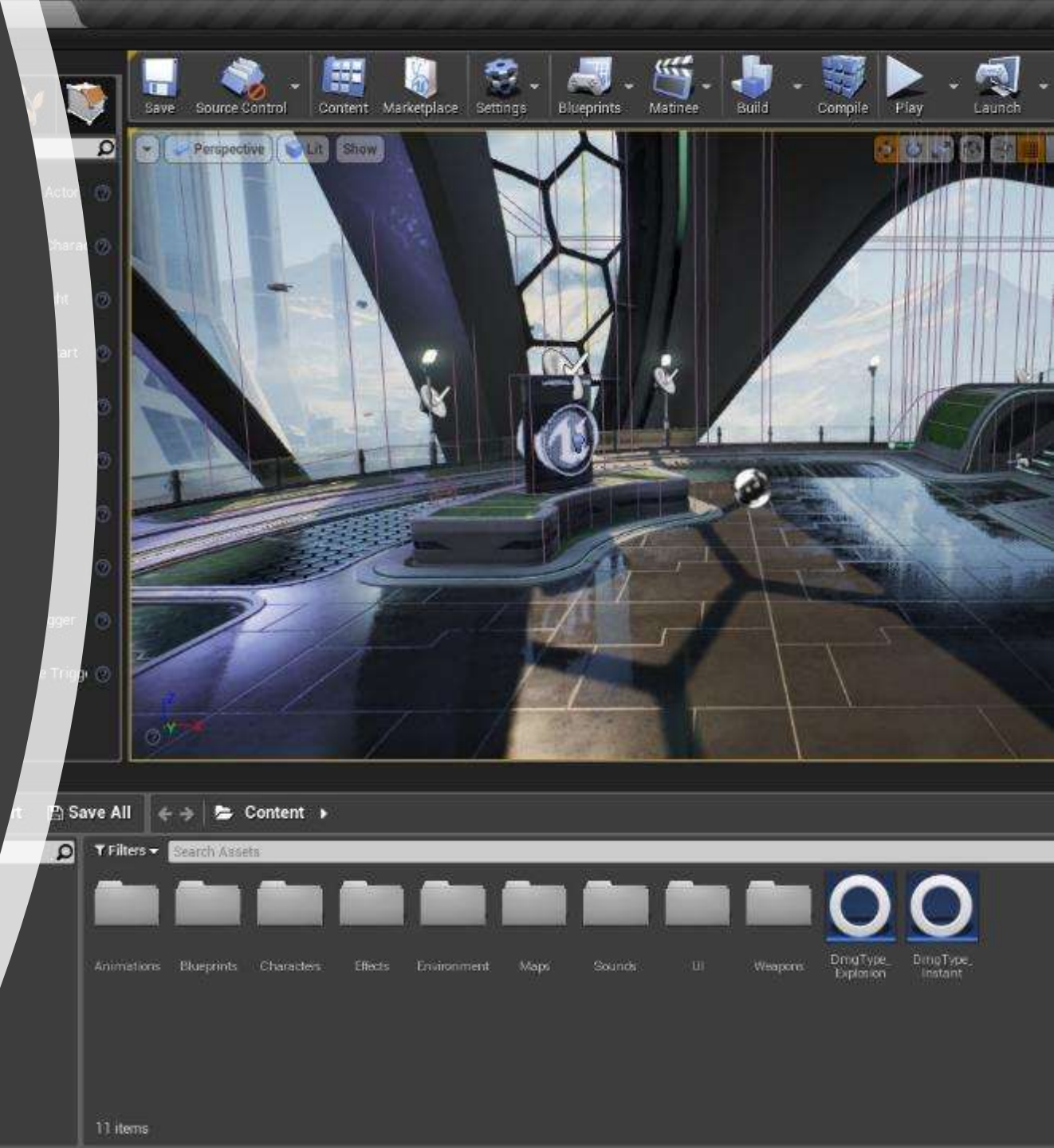


Moving images

Watch films in the Moving image collection

Resources - Software

- Blender
- SketchUp
- 3ds Max
- Fusion 360
- Mudbox
- Substance by Adobe
- Unreal Engine 4



Resources - Assets

- Textures.com
- Sketchfab
- Unreal Engine 4 Marketplace
- CGtrader
- Free3D
- Turbosquid

