Visualising Lighting for Cultural Arts and Heritage Projects

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3D / Immersive Visualisation | @hoarelea
About the speakers

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About the speakers

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Introduction

OUR BACKGROUND
The story of our journey in accurate lighting visualisation...

CASE STUDY ONE
The Cupola Room at the King State Apartments, Kensington Palace.

CASE STUDY TWO
The Dining Hall at Oriel College, Oxford University.
What is photometric lighting?

The correct setup of photometric lighting has always remained key to our workflow...
Visualisation
Kensington Palace – The Kings State Apartments

Cupola room case study.
Point cloud scans.
Building 3D geometry.

Manually building over the point cloud.
Detailed geometry.

Generating details using mesh processing software.
Materials and photographic references.

Unwrapping and applying textures from photo reference.
Lighting Design.

Interpreting the design intent.
Photometric Lighting.

Modelling and integrating custom light product specifications.
Oriel College – Oxford University

Dining hall case study
Originally Constructed in the 1620s!
Been restored several times since.

Wooden panel designs, ceilings, portraits and lighting all changed.
Preservation and Restoration

All wooden panelling, frieze and furniture to be completely renovated
Re-hanging of Portraits

To a more visible height, leaving only the two larger portraits at each end at a high level.
Updated Lighting Scheme

Minimum visibility, easier maintenance and better quality of light.
Dining Hall.

Ceiling Wash.
Dining Hall.

Picture Lights.
Dining Hall.

Timber Detail.
Dining Hall.

Window Lighting.
Dining Hall.

Downlights.
Dining Hall.

Task Lighting.
Re-Creating the dining hall from scratch.

No existing 3D model, no access to the site & limited references.
Creating the Materials
Difficult photo references.

All photos were taken on mobile devices, with varying levels of quality. Bad focus, exposure and incorrect white balance caused issues with identifying materials and details.
Creating the existing materials first.

All the existing materials created with overcast daylight to mimic the lighting conditions in the photo reference.
Physical Accuracy

Considering how light reacts with the material first is very important.

- Diffuse Reflectance
- Surface Texture / bump
- Glossiness
The Frieze.

Mock ups were 3D printed and painted by an artist.
The Frieze.

Mock ups were 3D printed and painted by an artist.
Adding the new paint décor.

Utilising VRay Blend materials within the slate editor.
Lighting and Material tweaks.

Using photometric lighting in 3ds max from a lighting designers specification.
Rendering the lighting in layers.

Each lighting set was rendered individually for creating the interactive.
Summary – Key Rules

CORRECT 3D GEOMETRY
Using reality capture and photo reference wherever possible.

PHOTOMETRIC LIGHTING
Using real world lighting setup and product specifications working in conjunction with a lighting designer.

PHYSICAL MATERIALS
Very important element in making sure that the lighting is represented correctly.

FINAL OUTPUT
Don’t over tweak it in post!