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Original Citation

Fitzpatrick, Frank and Unver, Ertu (2011) Digital Sculpting for Historical Representation: Neville Tomb Case Study. In: sculpture network Drawing Symposium UK 2011, 26th August 2011, Huddersfield, UK.

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Digital Sculpting for Historical Representation: Neville Tomb Case Study

Research Team
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This poster paper shows initial findings currently undertaken as part of the MRes programme at Huddersfield University: School of Art & Design

Despite digital 3D poly-modelling applications providing a common and powerful tool-set for archaeological, architectural and historical visualisation over recent years, digital deformation sculpting tools are little used at present within the area of historical visualisation.

More commonly applied within the video games and TV/motion picture industries, the intention of this research proposal is to combine such tools and methodologies with existing scanned data and historical knowledge to remediate and re-imagine lost sculptural form. The aim would be to support both academic and public understanding of such missing artefacts.

In addition, the research may promote alternative methods of prototyping within traditional stone carving industries and further provide an opportunity to critically evaluate approaches to deliberately mediated sculptural surrogates and their location within historical representation.

Research Project Proposal

The intended research will focus on an examination and partial re-construction of the Neville tomb at Durham Cathedral.

Vandalised during periods of religious and civil unrest, the tomb provides an opportunity to re-create and interpret some of the lost sculptural forms carved upon it. In addition, it affords the opportunity to further explore the use of polychromy on mediaeval stone carving.



1, Durham Cathedral and Jarrold Printing



2, 3, 4, 5, Fitzpatrick F August 2011



Project Workflow

Initial 3D scanning will take place and data will be used as a foundation for a base 3D poly model.

Fieldwork and research will be undertaken to establish likely missing data and the base model will be imported into Mudbox for sculpting to begin.

Material details and texture capture will be applied and the final model lit and rendered.

The Konica Minolta Scanner

The School portable 3D scanner captures the object surface from a single point. On activation of the scanner, the eye safe, light beam/laser moves across the target object. The laser touches the object and the light is reflected back to the scanner, which captures the surface data of the shape, and records the measurement of an object at a distance between 4 mm or 3 metres.

The measurements are translated into an impact location, and are then displayed by the software as cloud point data, or cloud data which initially form the 3D shape of the recorded object in the 3D software



GeoMagic Software

The software interface offers specific 3D surface design tools which take the user through a sequence of surface processing phases; from organising the scanned physical surface data, to surface preparation and composition of accurate models for 3D design and manufacture.



3d3solutions.com sourced August 2011

Initial Investigations: ZBrush Sculpting Tools



Part of an initial examination of digital software for the production of digital sculptural form.

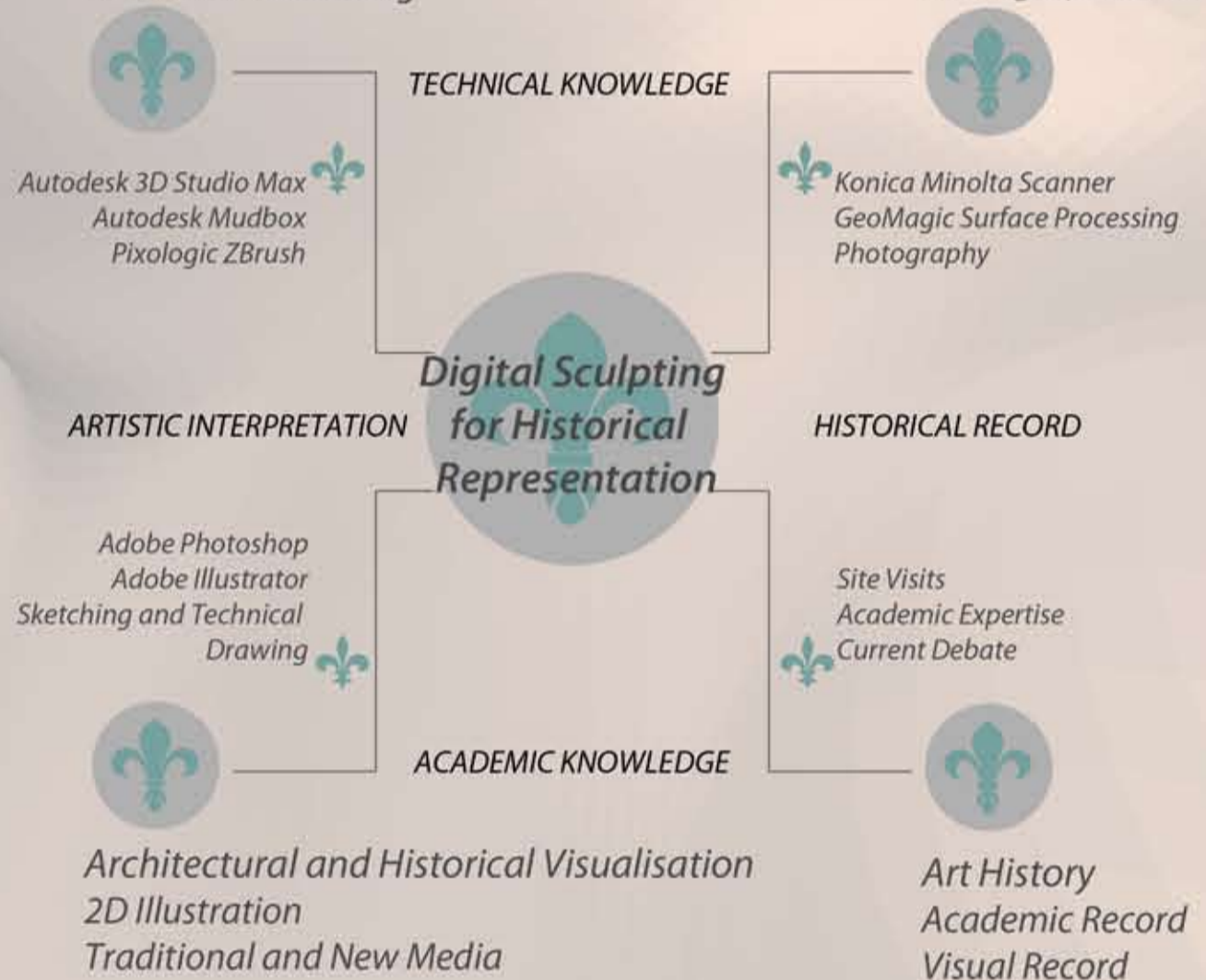
Here a 'base rig' is created using ZSpheres. A polymesh conversion takes place and the polymesh is then subdivided in stages to allow for finer sculpting and texturing to take place. Posing and combining of sculptural elements is then completed before a final stage (yet to be undertaken) of correction, texturing, lighting and rendering.

Based on Ramey's Theseus and the Minotaur: Fitzpatrick F 2011

Location of Research

Digital Entertainment Arts
Games Technologies
CGI and 3D Modelling

3D Scanning
Surface Acquisition
Photographic Record



Objectives

- To assess current digital sculptural approaches and methodologies and locate existing gaps within current archaeological and historical visualisation
- To explore how such methods and processes may be utilised in combination with 3D scanning, 2D Photometric and Photosynth recording, Digital Painting and Rendering, Games Engine and Rapid Prototyping technologies.
- To establish appropriate workflows and methodologies through the re-creation of a lost/damaged historic sculptural form
- To assess the role of digital sculpting within the on-going dialogue that surrounds historic visualisation, communication, consumption and its ethics and responsibilities.

Contribution

Outcomes of the research will result in a contribution to the application of digital deformation toolsets and methods in the remediation of historic, archaeological and sculptural artefacts. It will provide opportunities for those working within the field of archaeological and architectural visualisation specific and relevant feedback based upon project outcomes and critical analysis. It is hoped that the project will contribute to the on-going debate around historical visualisation and the role of the artist/practitioner in the interpretation of lost sculptural artefacts, and provide an example of alternative methodologies for those engaged in traditional stone carving for historical renovation and repair.

References

- Saul Nigel (2009) *English Church Monuments in the Middle Ages* Oxford University Press
Kus, A., Unver, E. and Taylor, A. (2009) 'A comparative study of 3D scanning in engineering, product and transport design and fashion design education' *Computer Applications in Engineering Education*, 17 (3), pp. 263-271. ISSN 1061-3773
BÖHLER Wolfgang, BORDAS VICENT Monica et al. (2004) *High Quality Scanning and Modeling of Monuments and Artifacts* FIG Athens, Greece
Coltrain James, (2009) *Reimagining Past Worlds: Issues and Challenges in the Use of 3D Graphics for Historical Reconstructions* JDHCS Chicago
Falk Anderson Eike, McLoughlin Leigh et al. (2009) *Serious Games in Cultural Heritage VAST - State of the Art Reports*
Levy Richard M, Ph.D. (ND) *Computer Visualization and Architectural Reconstruction: An Image of Reality* University of Calgary
Zhiqiang Du, Tingsong Wang (2009) *Detail-Preservation 3-D Modelling for Elaborate Buddha Sculpture* 22nd CIPA Symposium, Kyoto, Japan
Steen, Joep van der. *Rendering with Mental ray & 3ds Max* Amsterdam ; London : Focal, 2007

Project Timeline

