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Virtual Stonehenge Reconstruction

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# VIRTUAL STONEHENGE RECONSTRUCTION

## Project paper



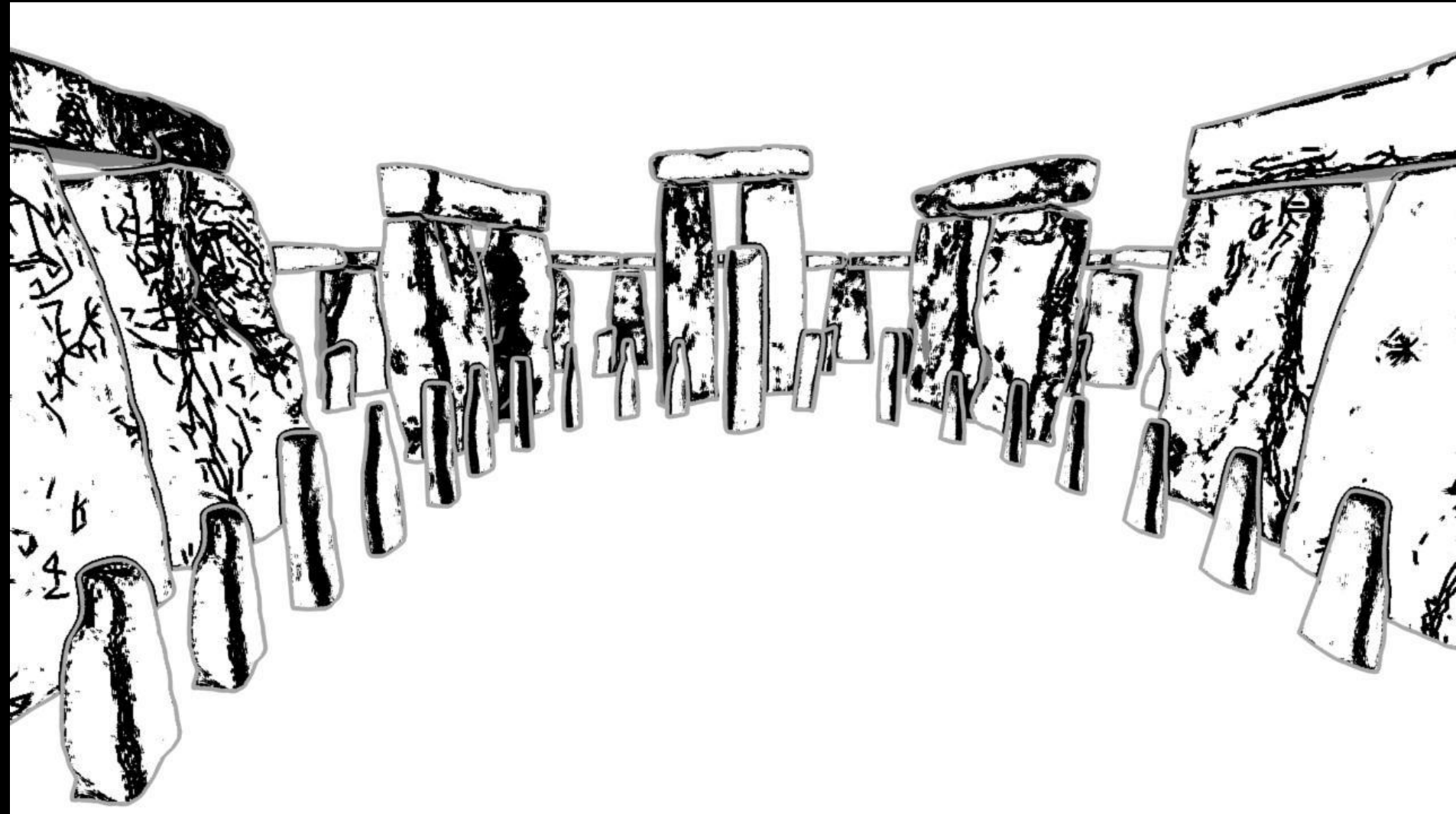
**Dr. Ertu Unver & Andrew Taylor**

**University of Huddersfield, School of Art, Design & Architecture, Huddersfield, UK.**

**International Conference on Cultural Heritage. EUROMED 2012. CYPRUS.**

# PROJECT RESEARCH: Introduction

## Artists & Designers in Cultural Heritage

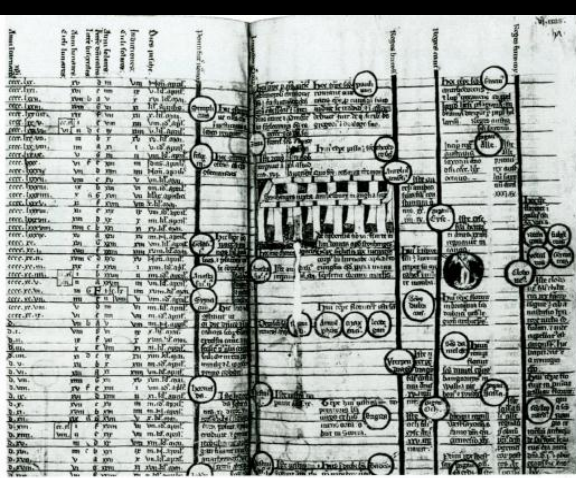




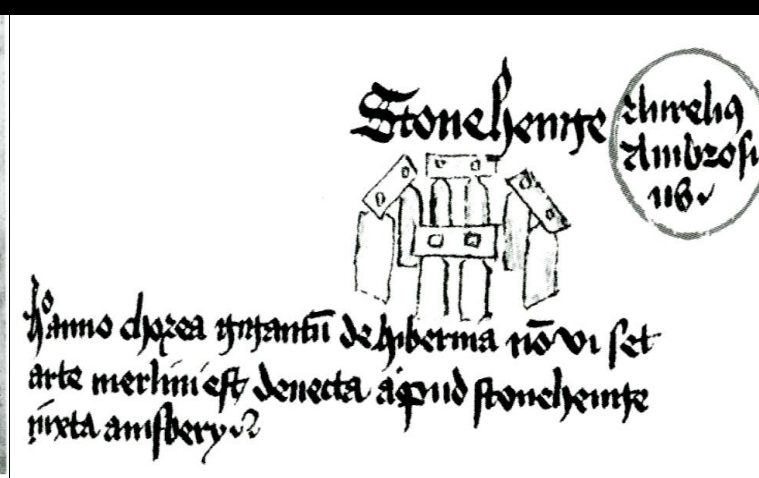
Jeremy Deller, 'Sacrilege', 2012. at Glasgow International 2012  
Photo: Marc Cairns.



Jeremy Deller, 'Sacrilege', at London 2012 ,Canary Wharfe.  
Source: Peter Macdiarmid/Getty Images Europe)



c.1340. Scala Mundi chronicle of the world



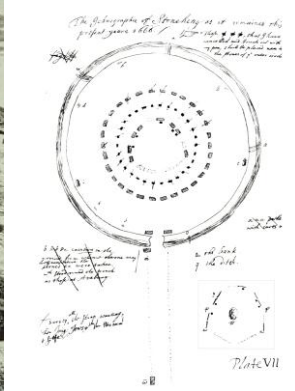
c.1440. Artist Unkown



c.1575. Lucas De Herre



c.1625. Inigo Jones



c.1665. John Aubrey



c.1700. William Stukeley



c.1790. JW Turner



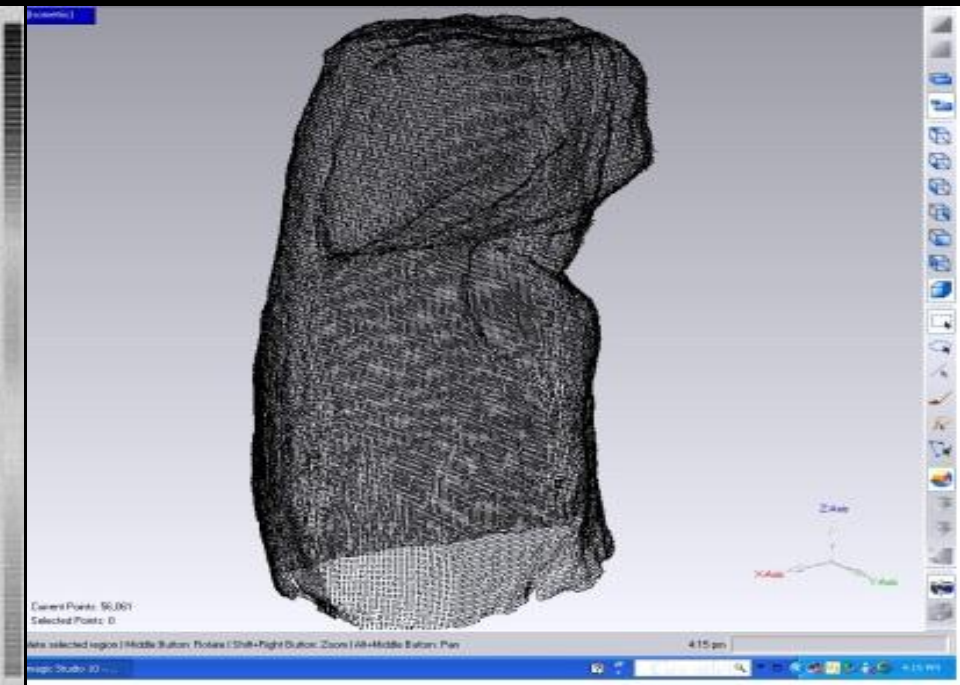
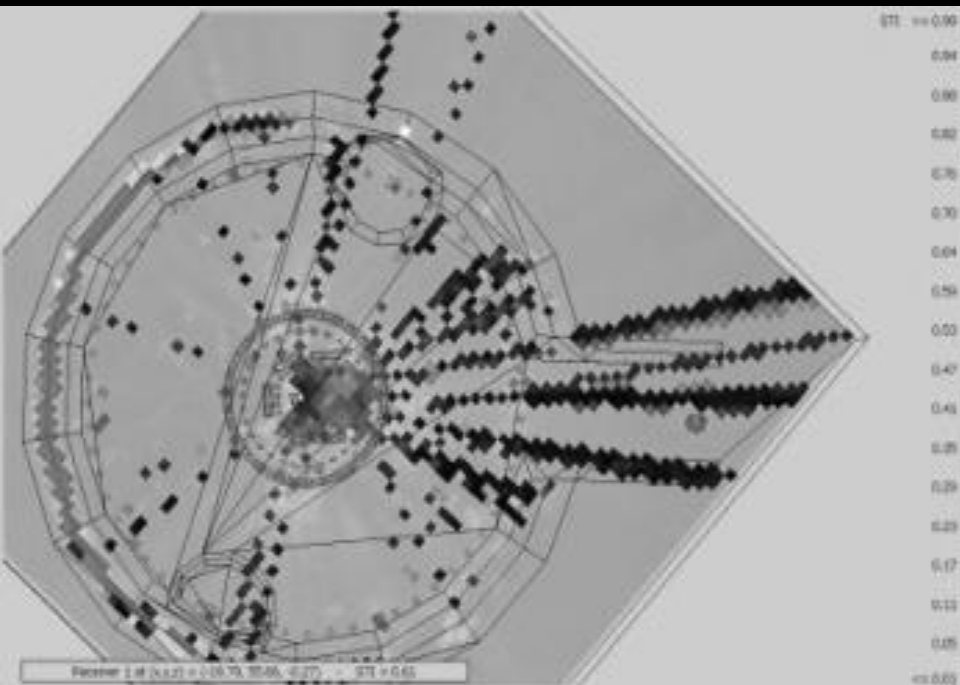
c.2010. Heritage Key



c.2011. Stonehenge in Second Life



c.2012. Greenhatch grp & English Heritage



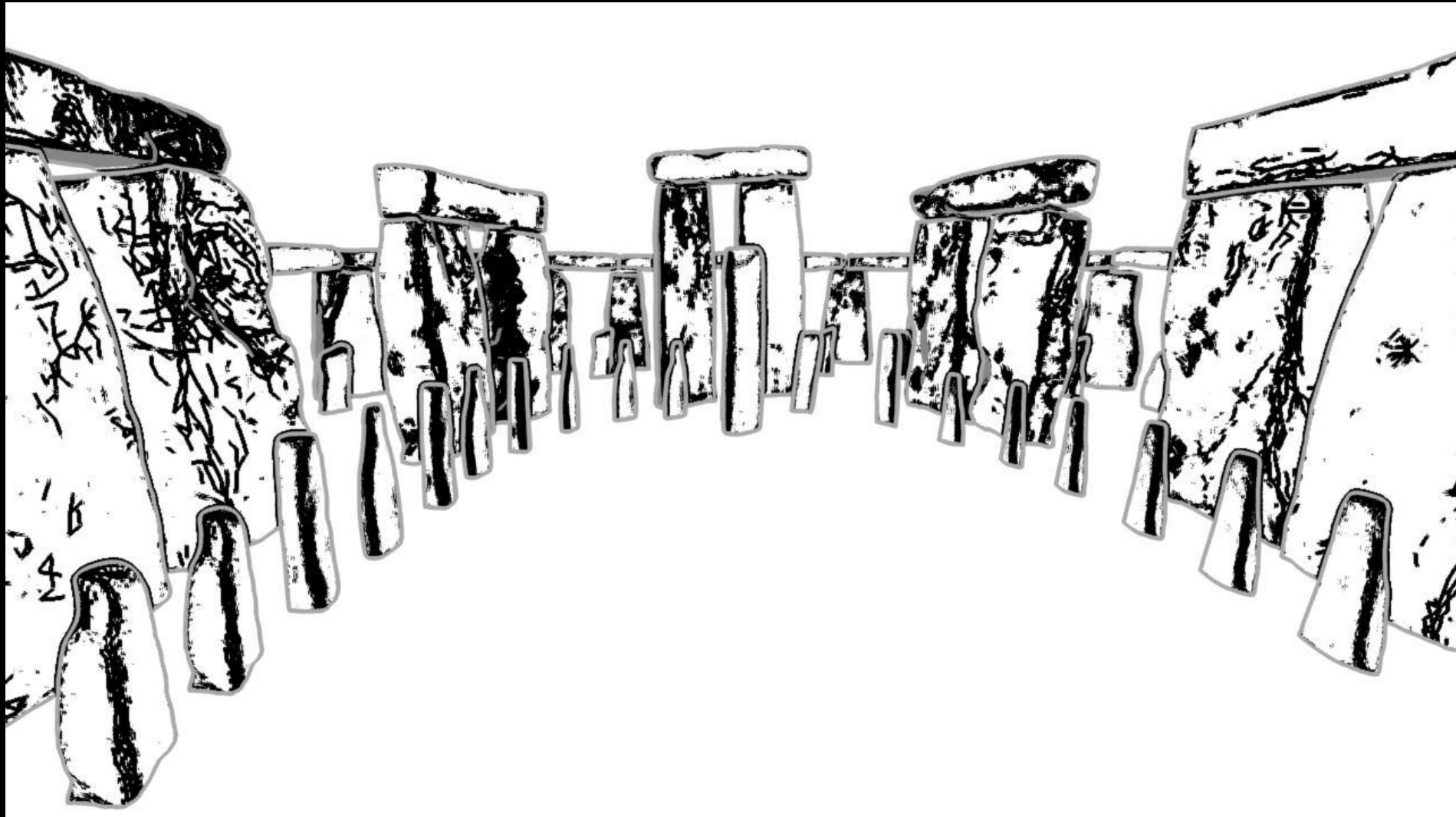
Process phases of 3D artwork & introduction to the journey.....

# 3D Digital Stonehenge

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# PROJECT RESEARCH:

Stone Circle site visit & English Heritage Archives





Taylor, A ( August 2009) Images recorded inside the Stone Circle at Stonehenge at Sunrise.  
Stone Circle access granted by permission of English Heritage

Heel Stone. Digital recording of the stone: shape, surface/ textures and effects of daylight environment



Taylor, A (2009) Sourced at Stonehenge. August.

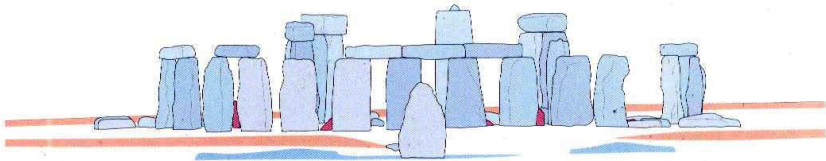


Taylor, A (2009) Recorded inside Stone Circle at Stonehenge

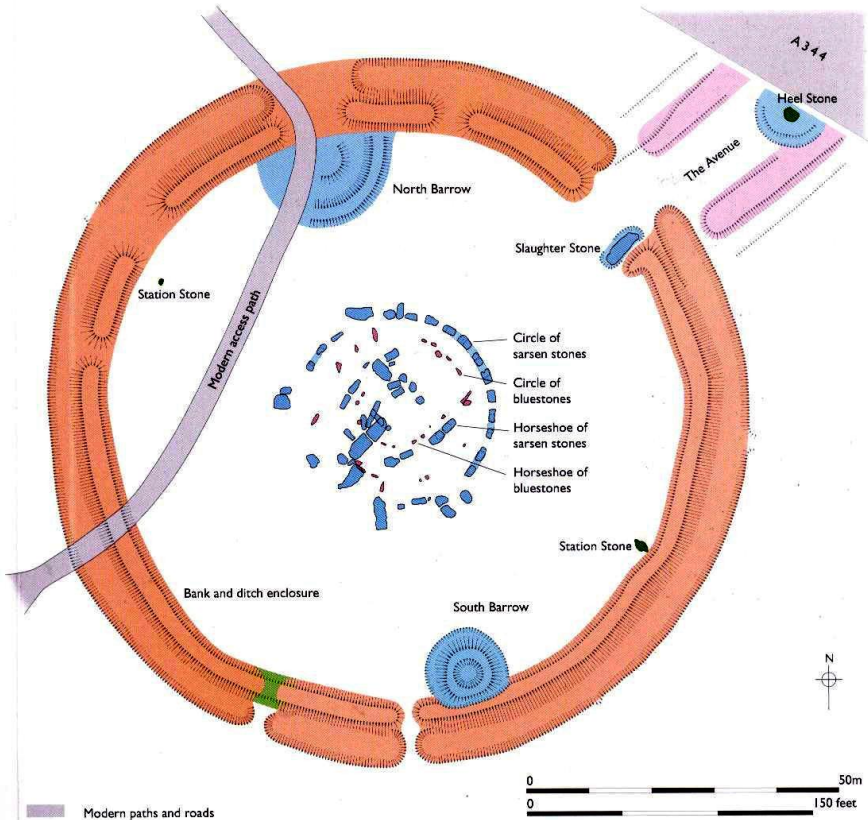


Taylor, A (2009) Recorded at Stonehenge

THE STONES VIEWED FROM THE AVENUE



PRESENT DAY STONEHENGE



English Heritage Guidebook (2005) Stonehenge.

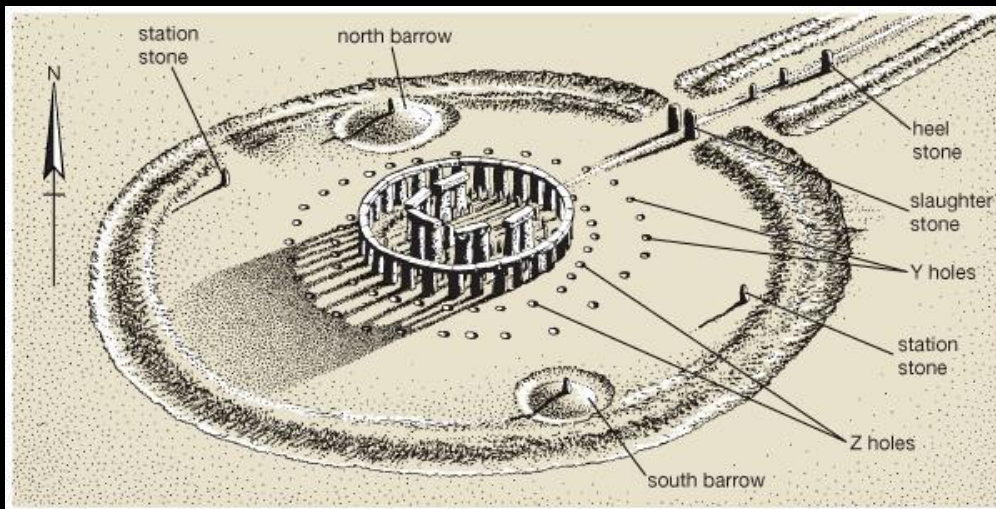
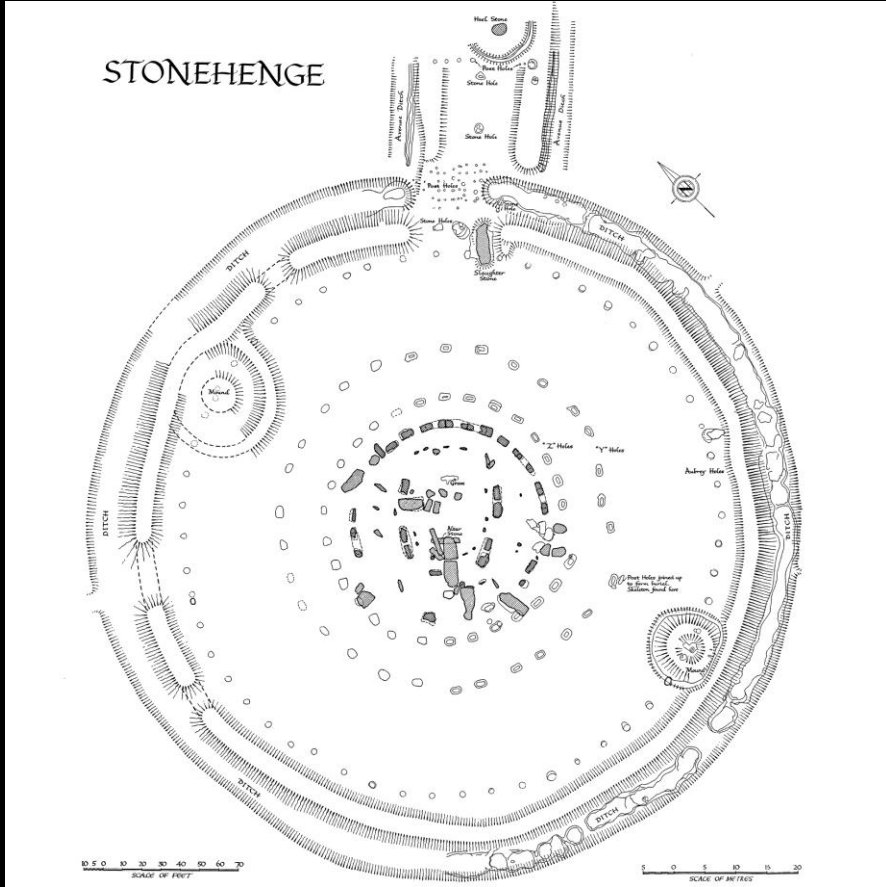
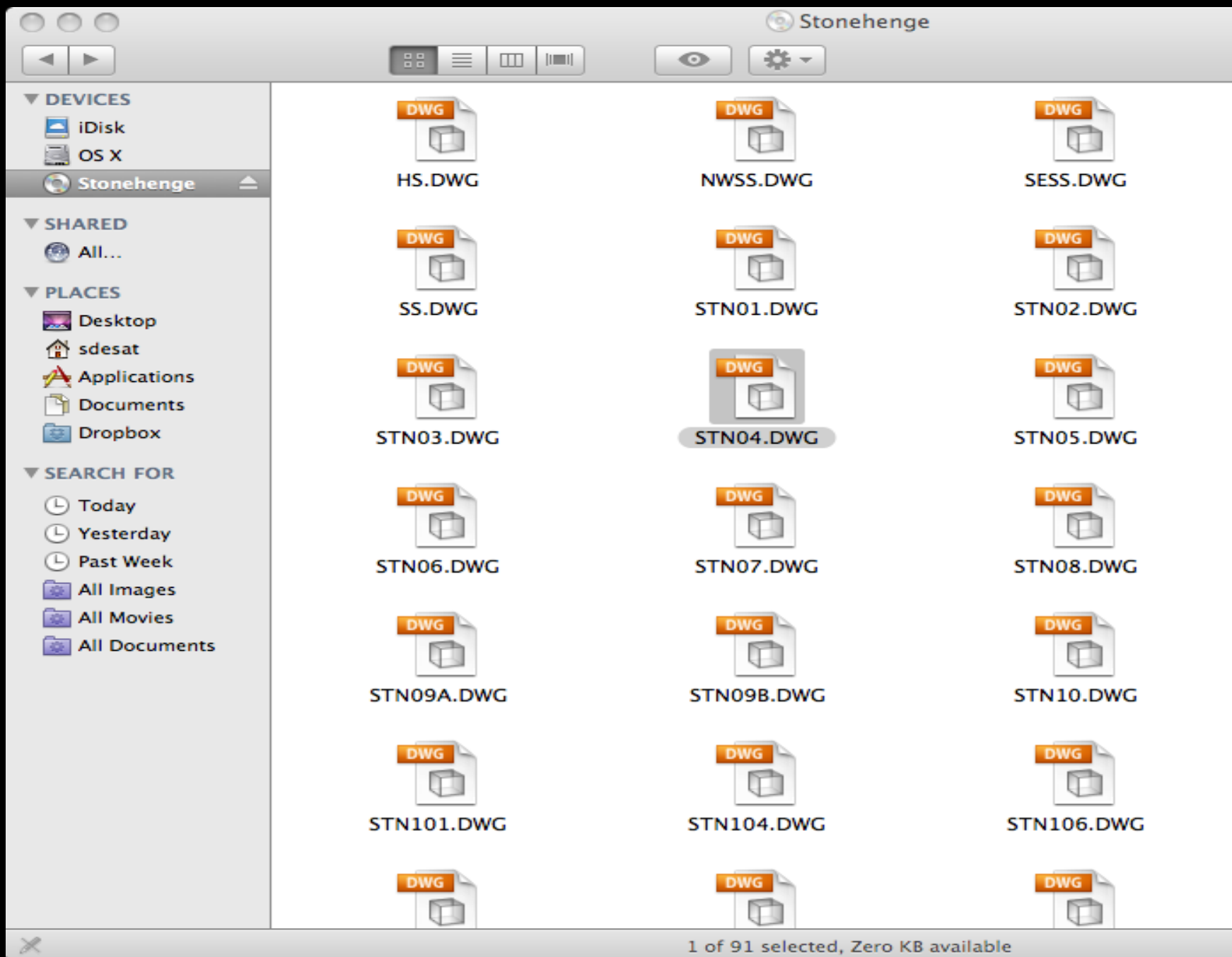


Diagram of Stonehenge 1550 bce  
 Source: Britannica.com & English Heritage

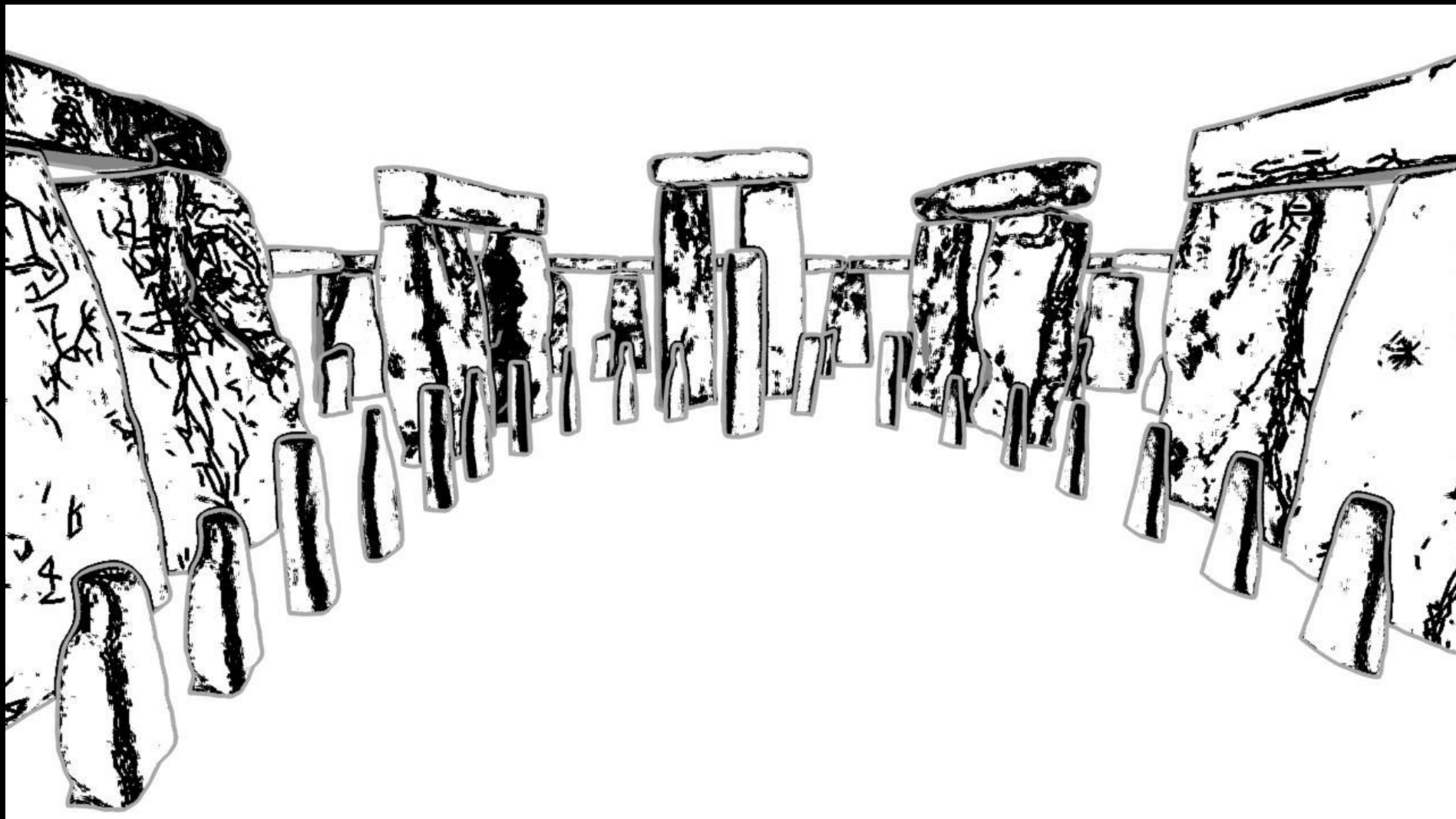


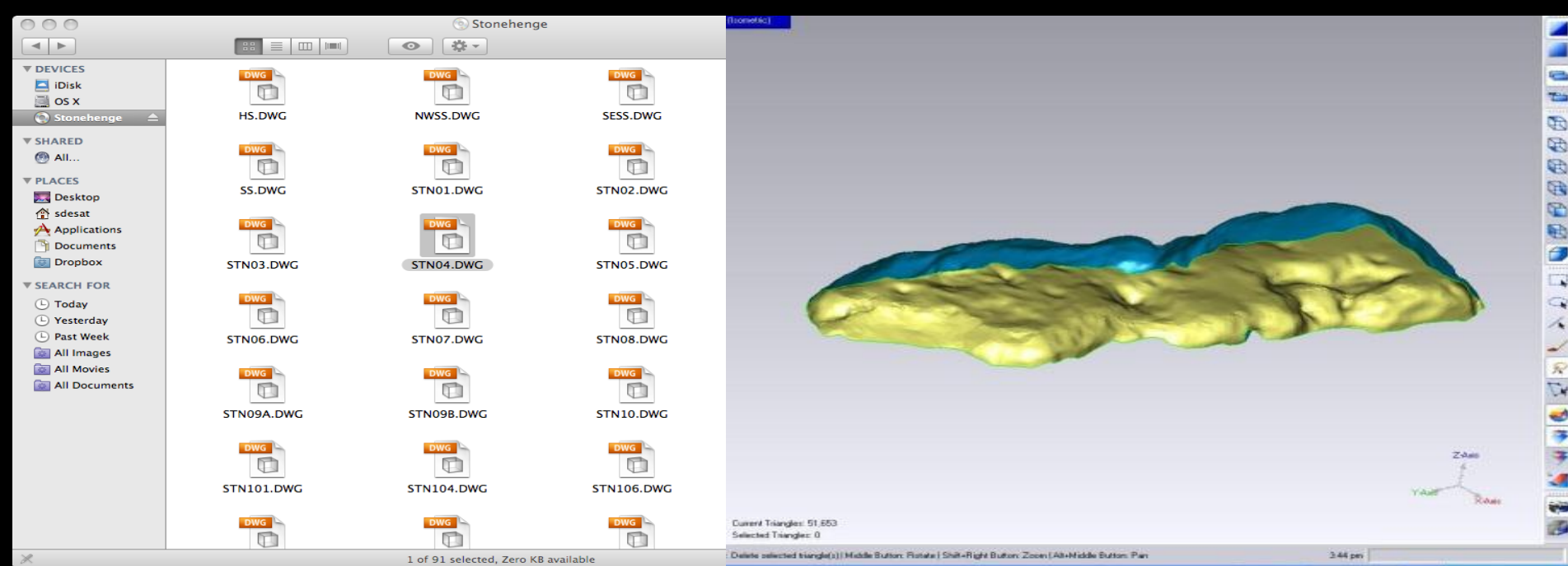
Stonehenge Survey engraving c.1740  
 Source: English Heritage National Monument Record Archive 2009



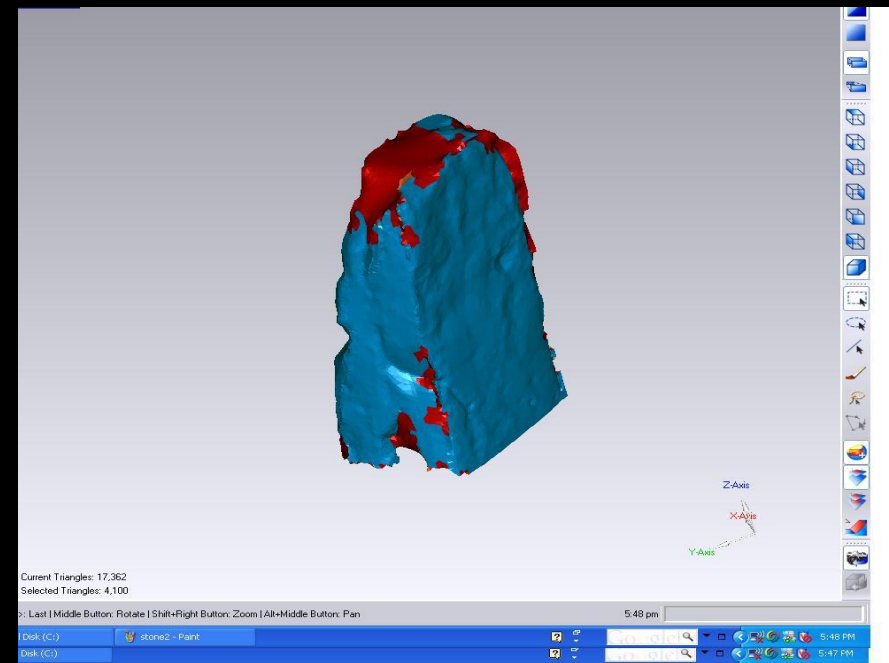
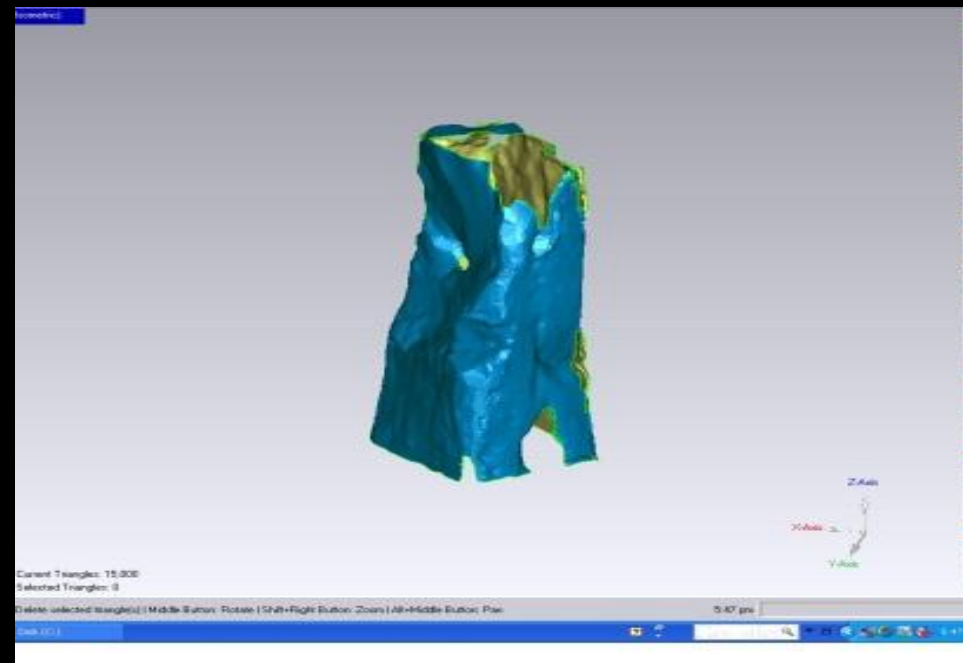
# PROJECT RESEARCH:

## Point cloud data processing





Single Stone data. Point cloud data processing and stages of surface generation for each individual stone



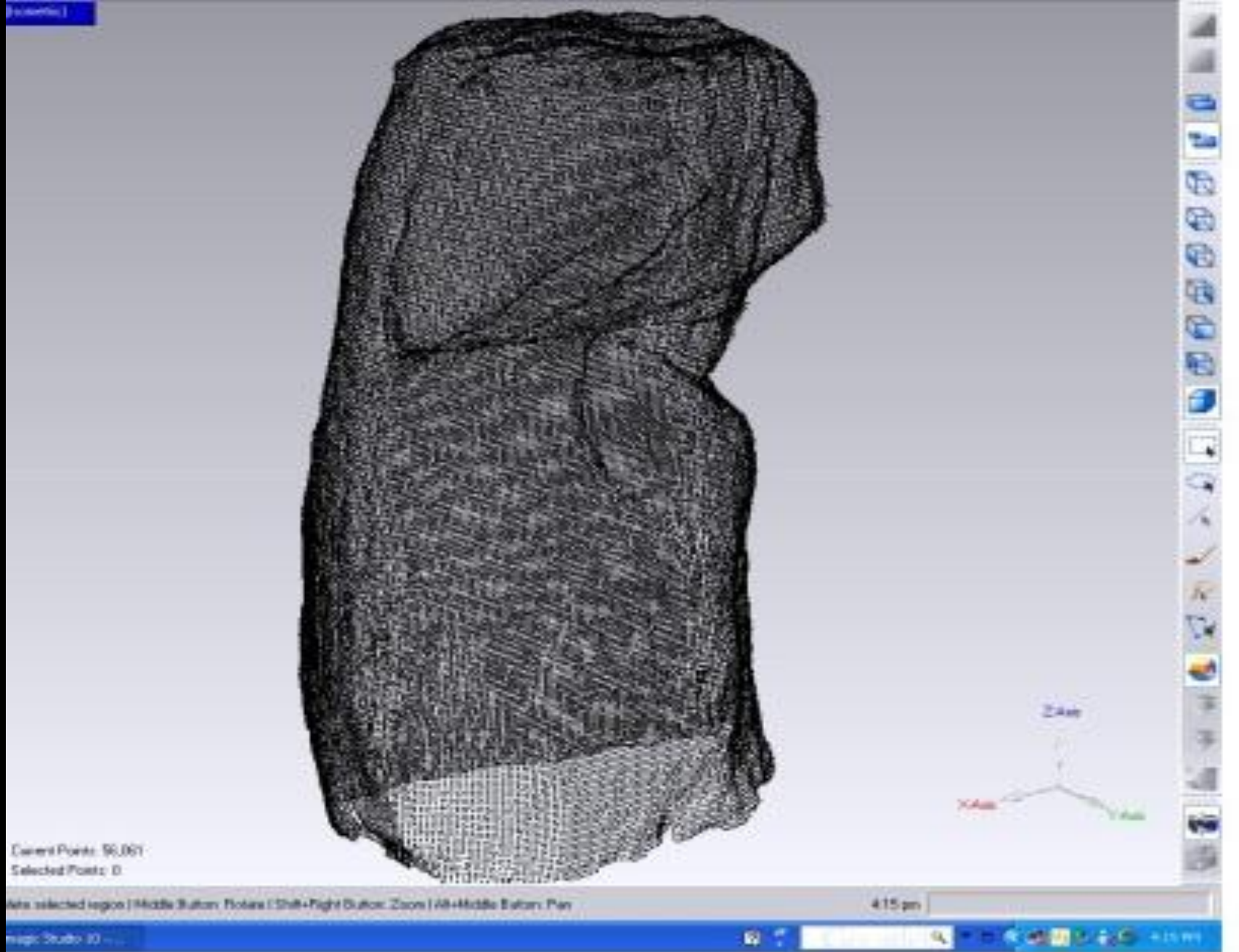


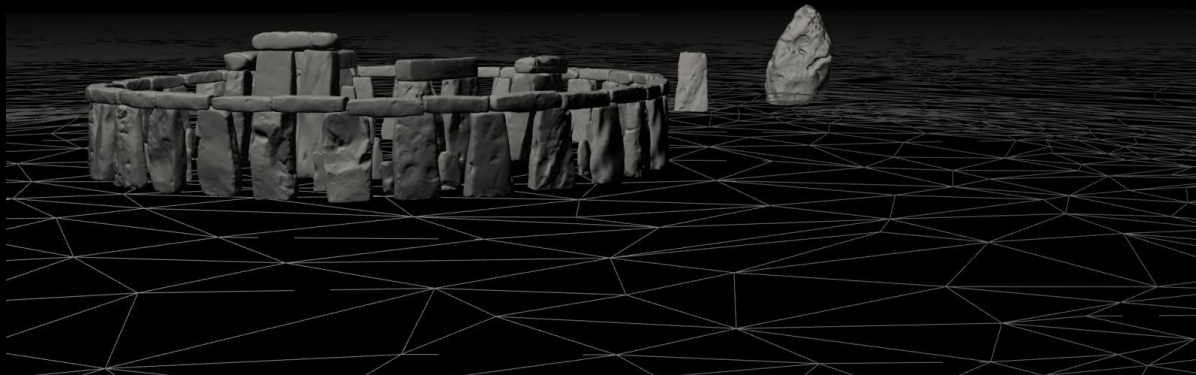
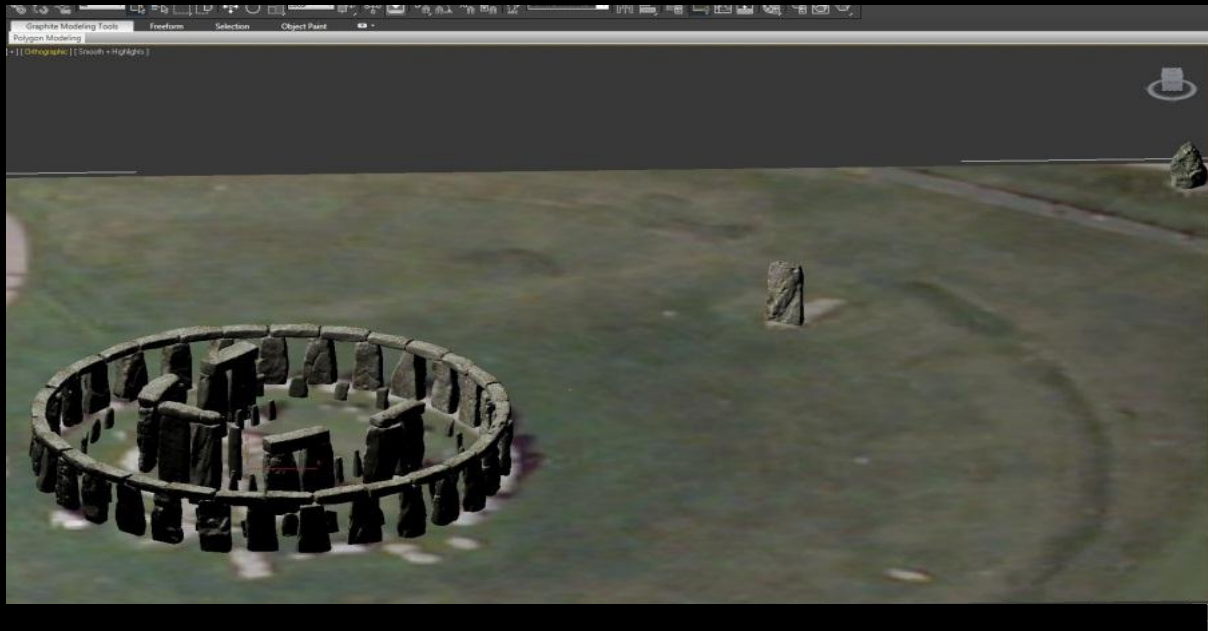
Image of completed stone surface mesh

# PROJECT RESEARCH: Use of LIDAR data

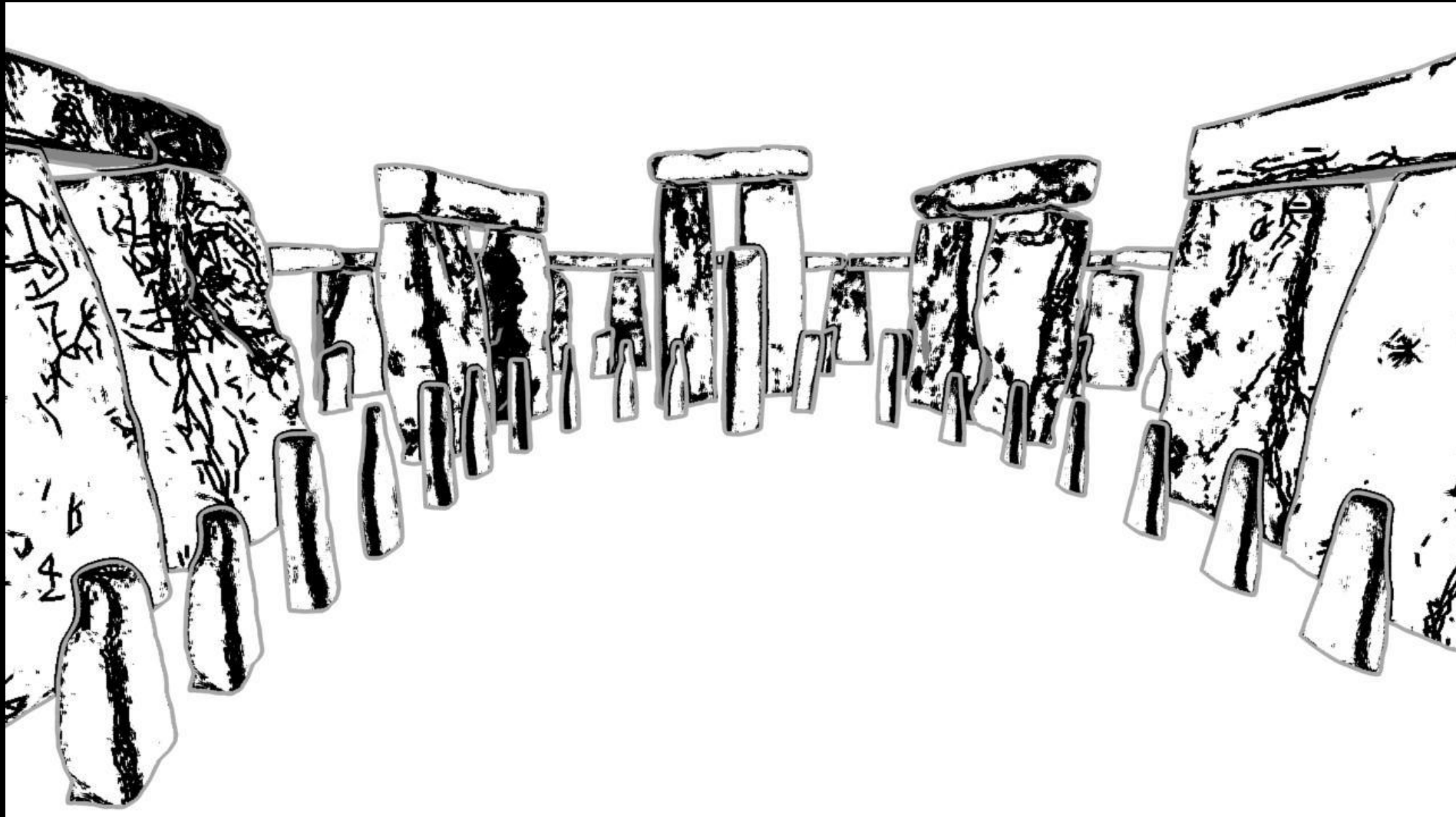


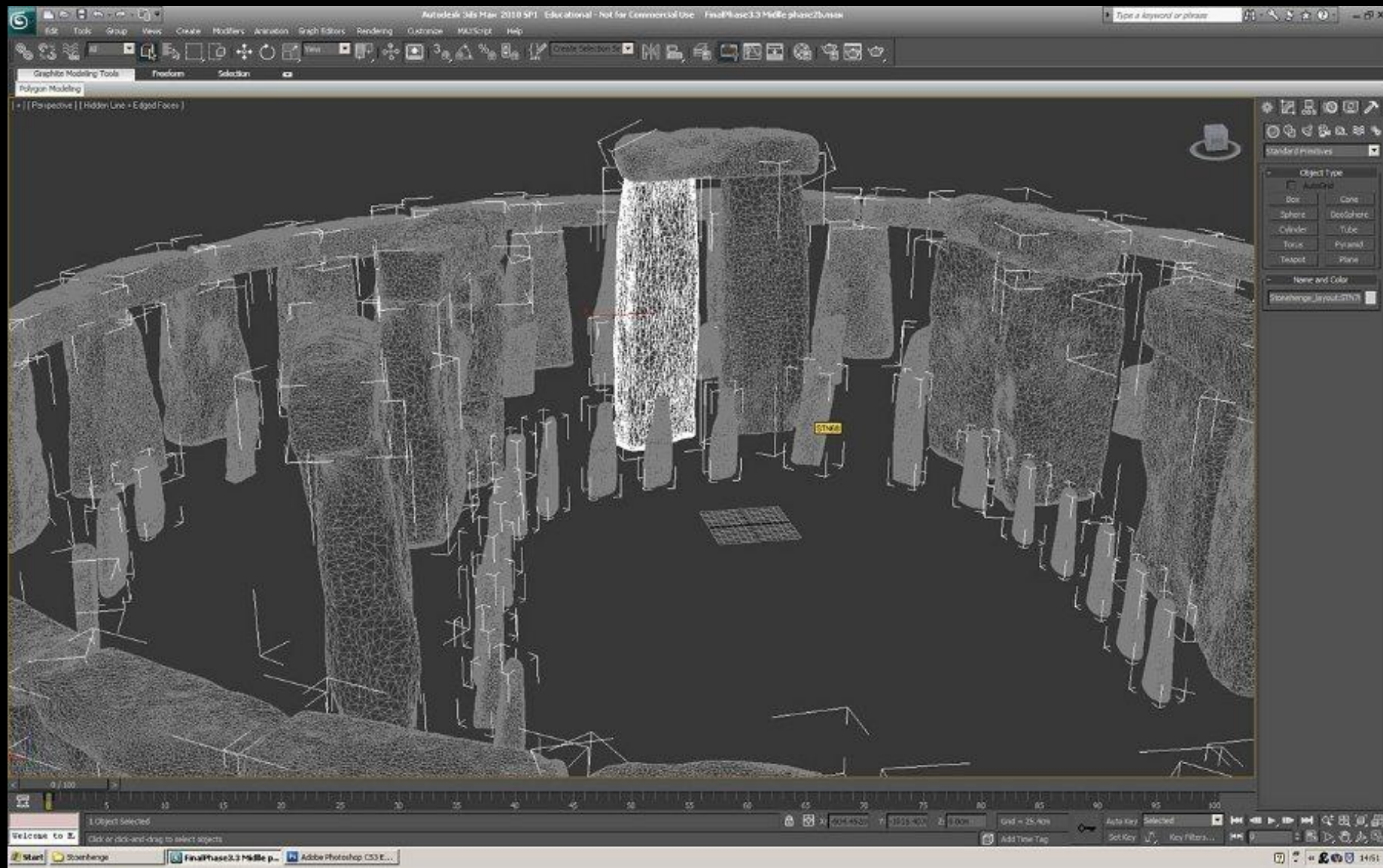


# Scaling and Positioning: Google Earth & LIDAR



# PROJECT RESEARCH: Modelling





Mesh view of untextured 3D model of Stonehenge during modelling.

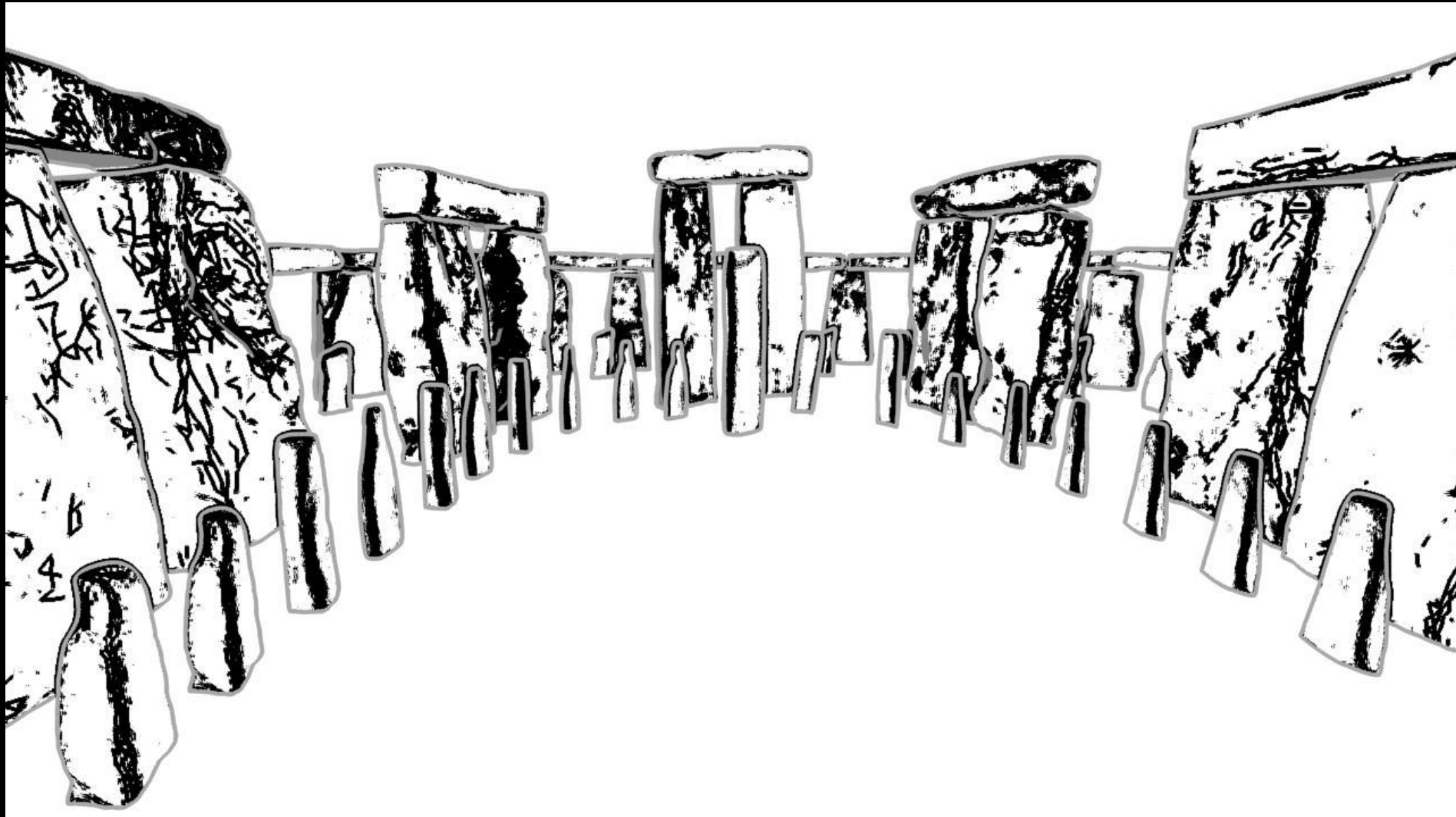


Initial renderings of 3D CG model of Stonehenge



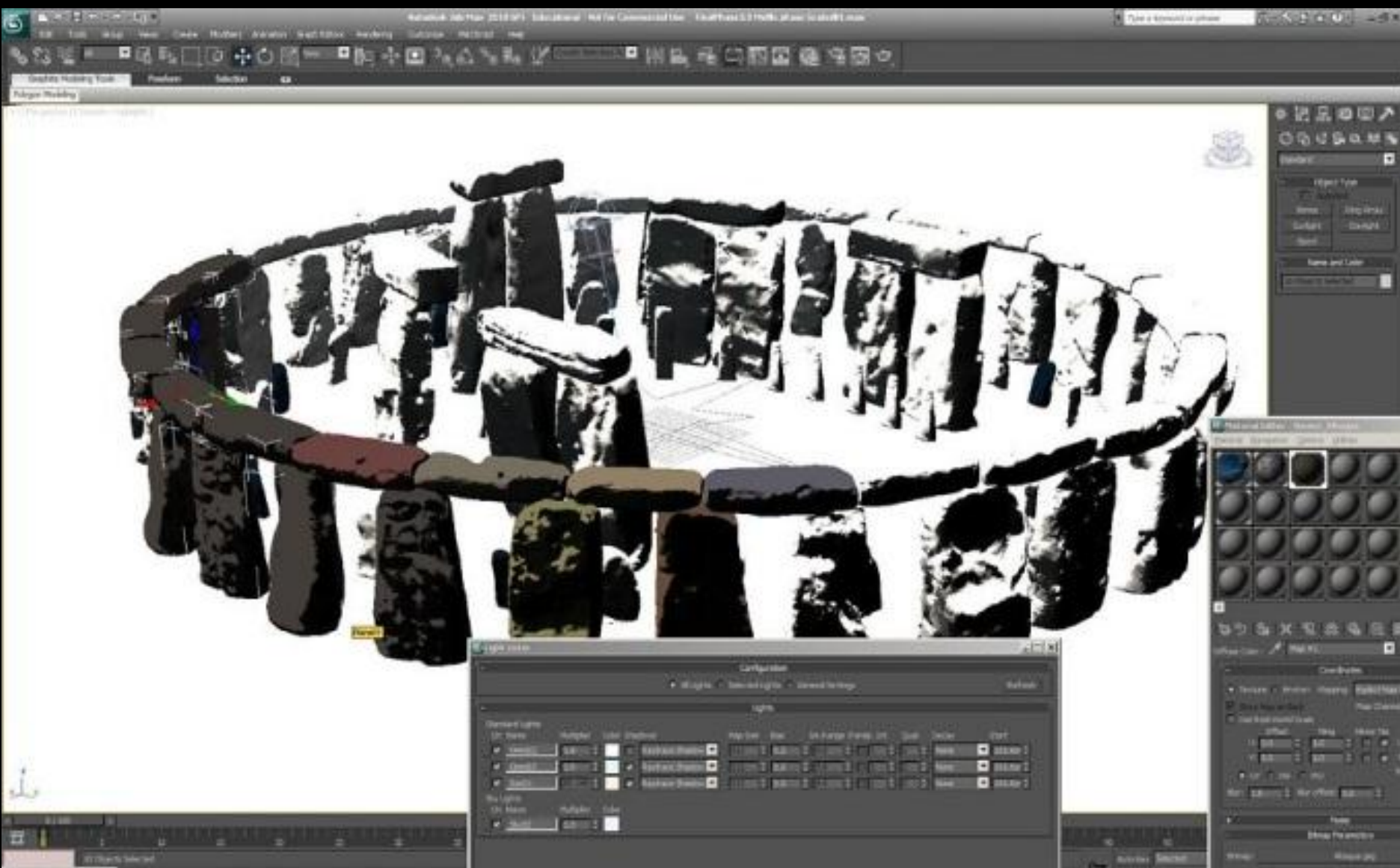
3D model of Stonehenge with a rigged human character imported to test realistic scale

# PROJECT RESEARCH: Texturing & Rendering



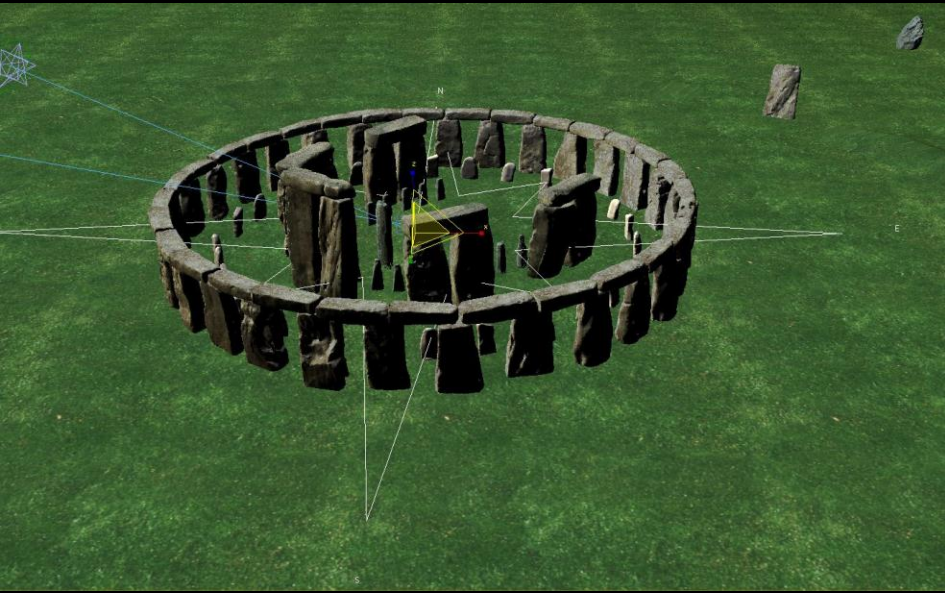


Digital photographic surface texture images for 3D texture mapping



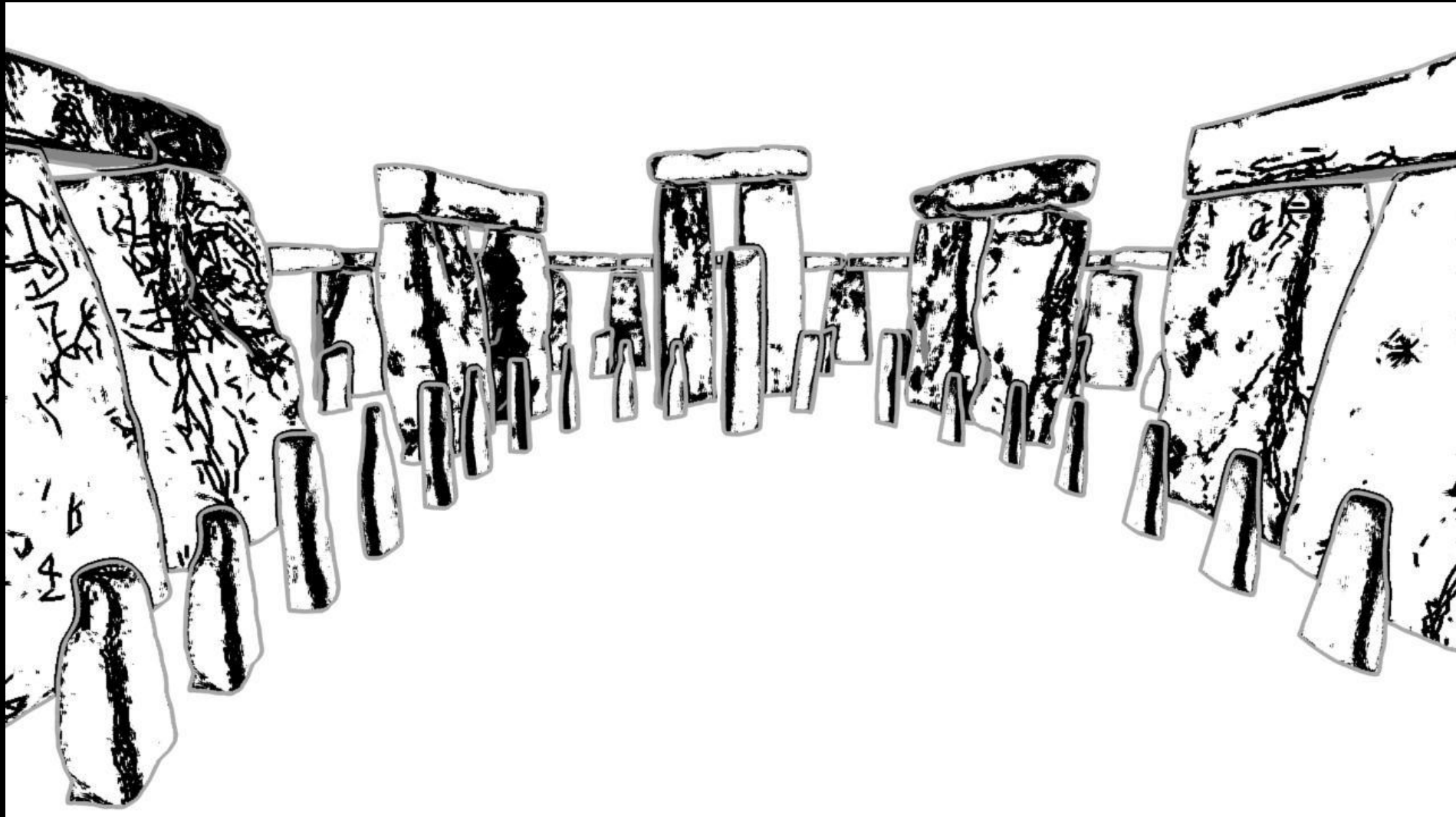
Experimental materials and texturing processes

# Mental Ray renderings using daylight system

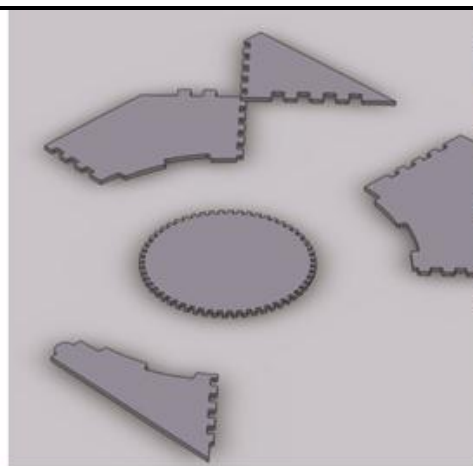
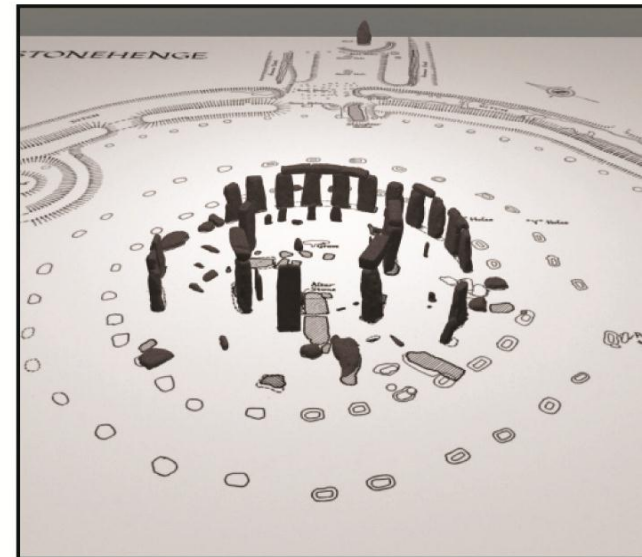
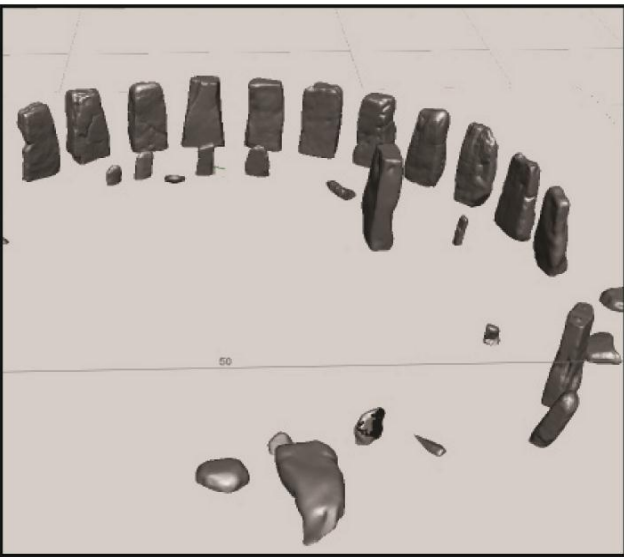




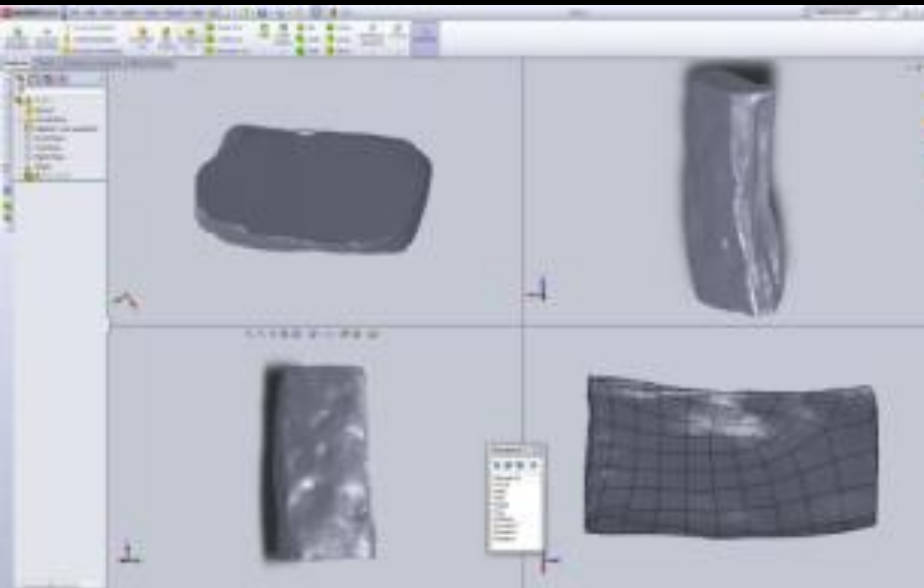
# PROJECT RESEARCH: Product design developments



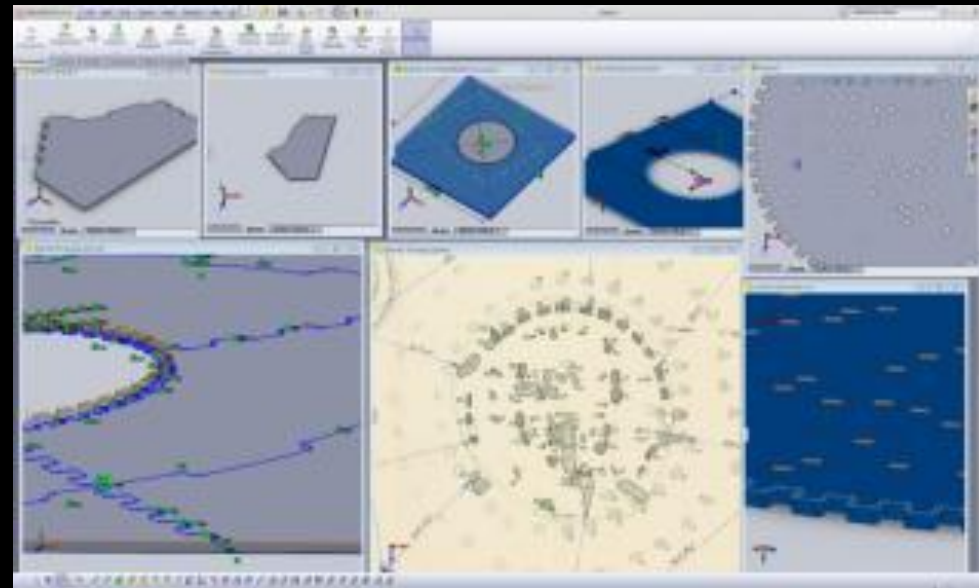
# Product Design application: Stonehenge Megalithic Puzzle game



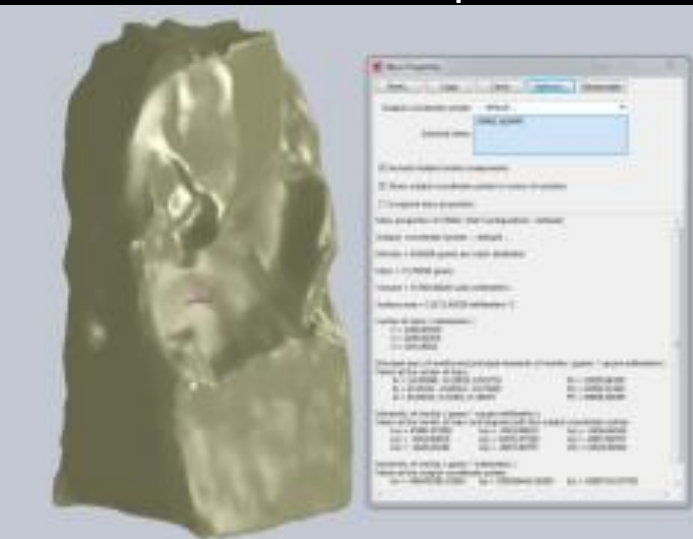
# Product design applications: Solid modeling, Vector drawing & Rapid prototyping



1. NURBS mesh for product analysis



3. Laser cut maps for puzzle game

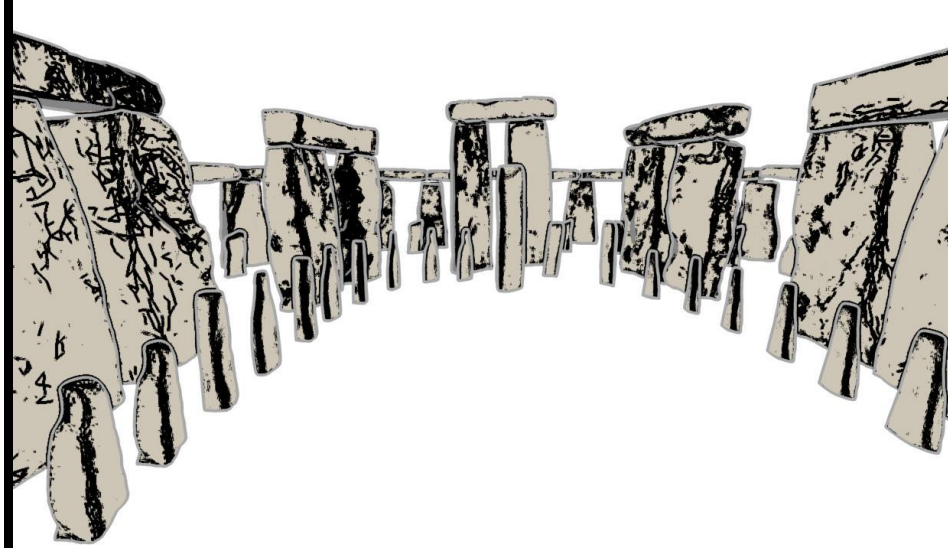


2. FEA (Finite element analysis)

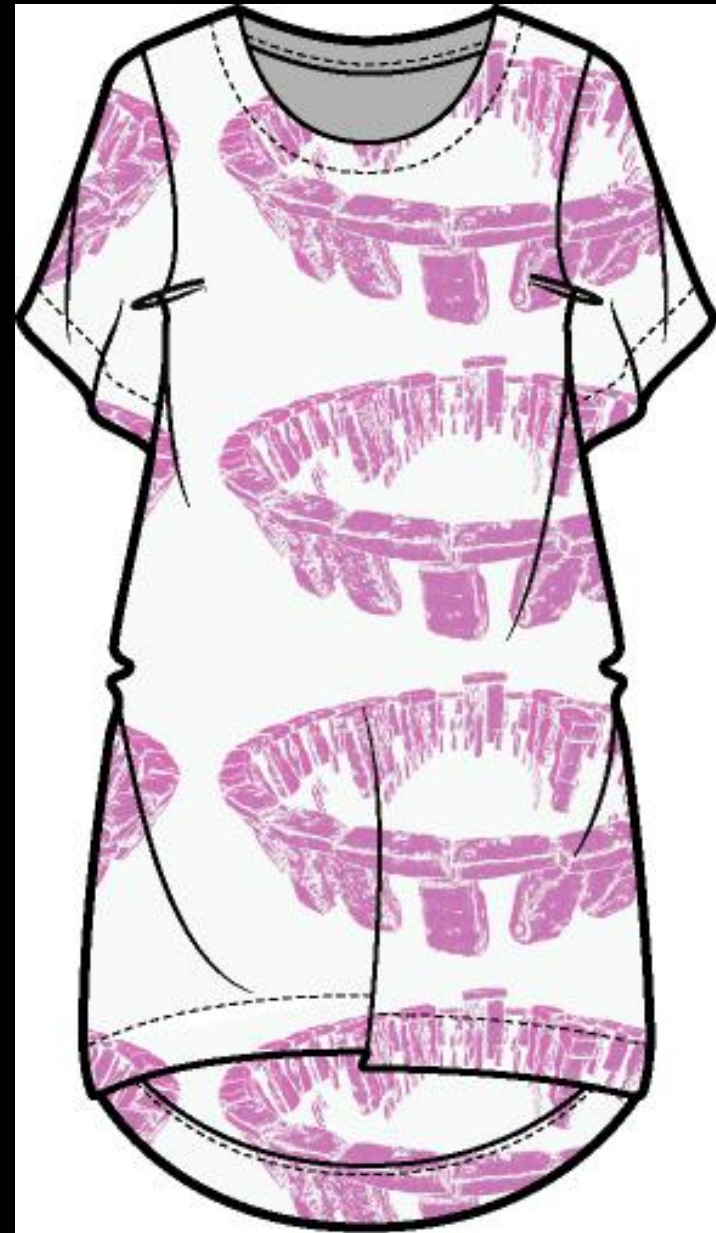


4. 3D printed stones and characters

# Digital illustrations & Product graphics

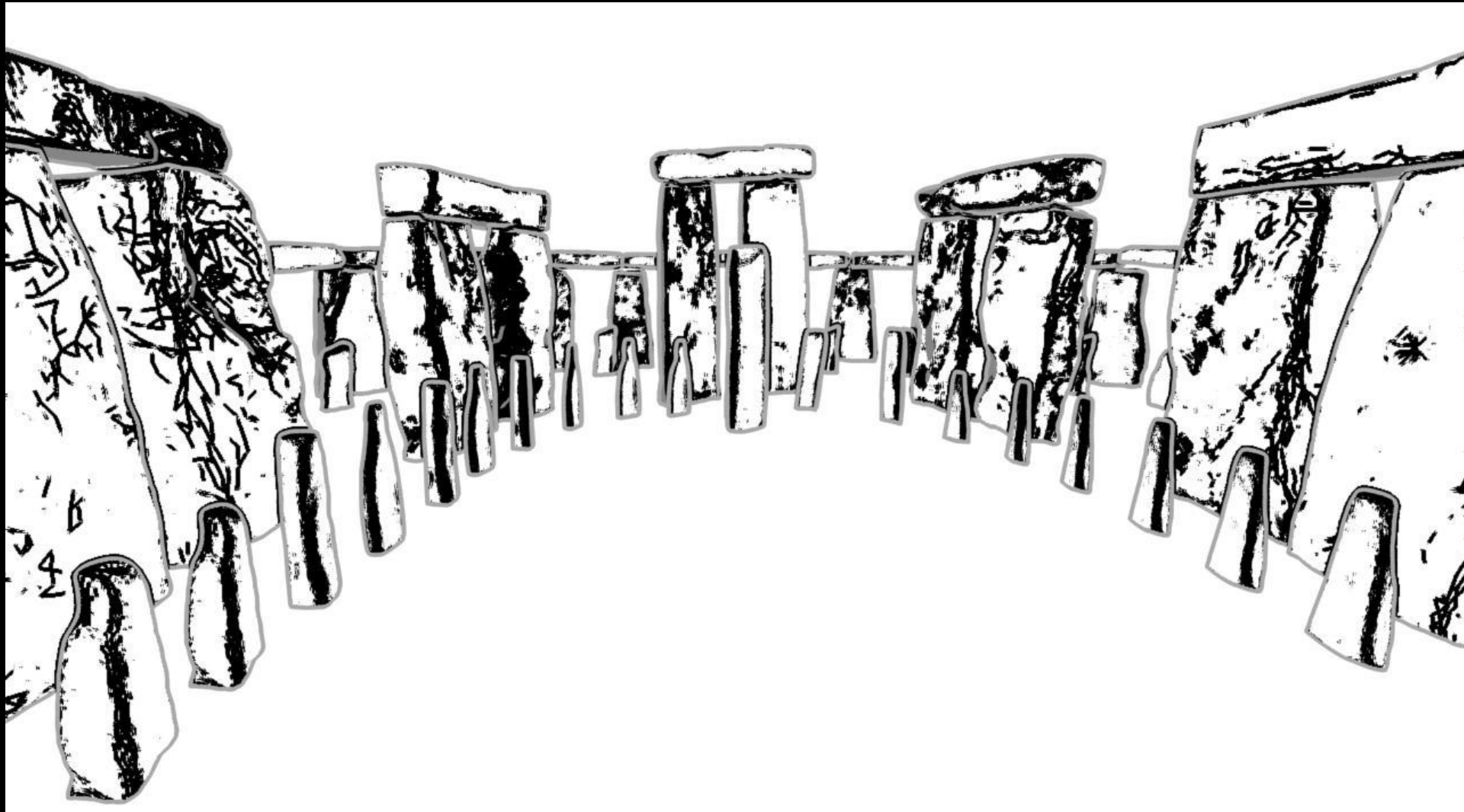




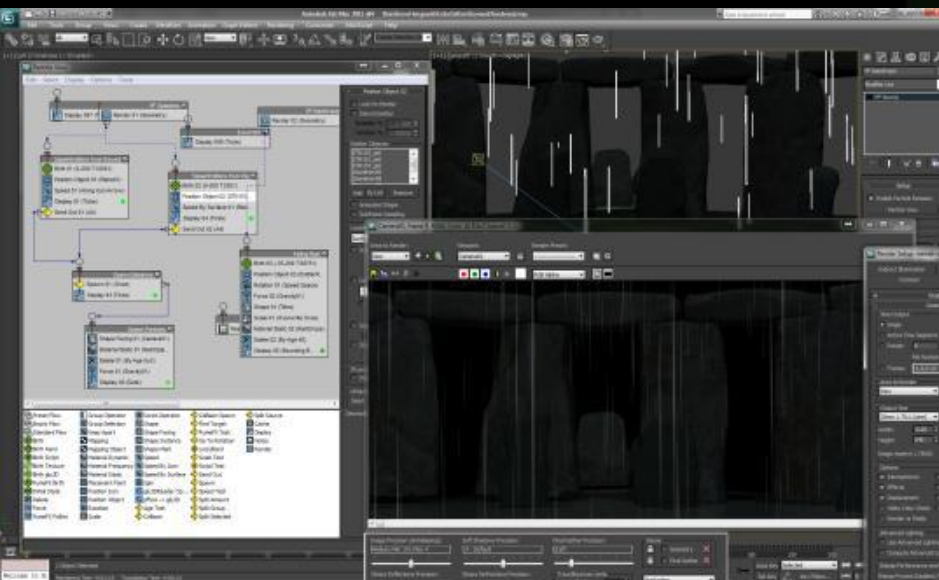


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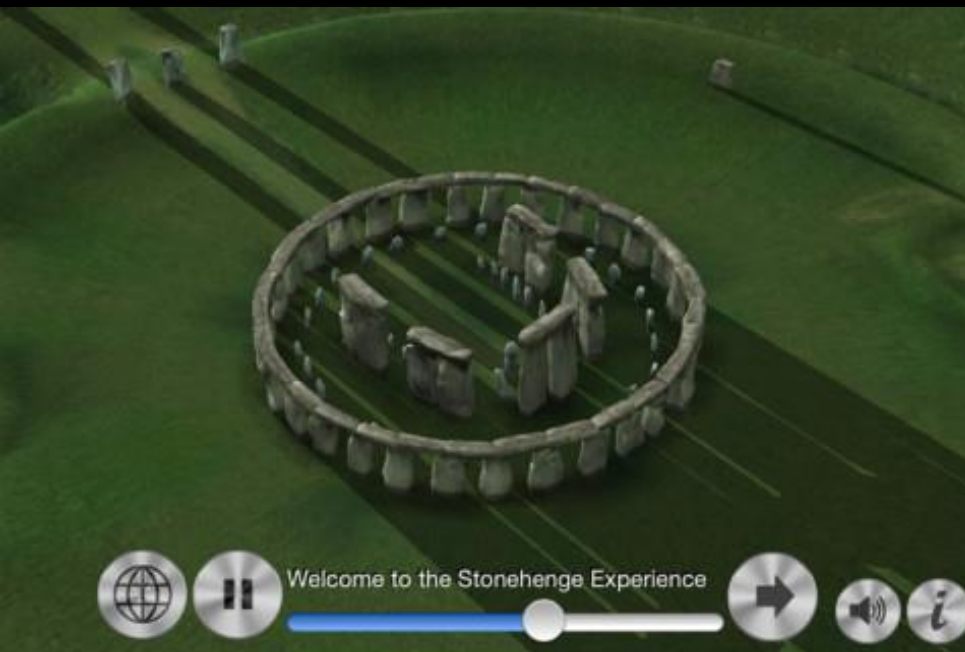
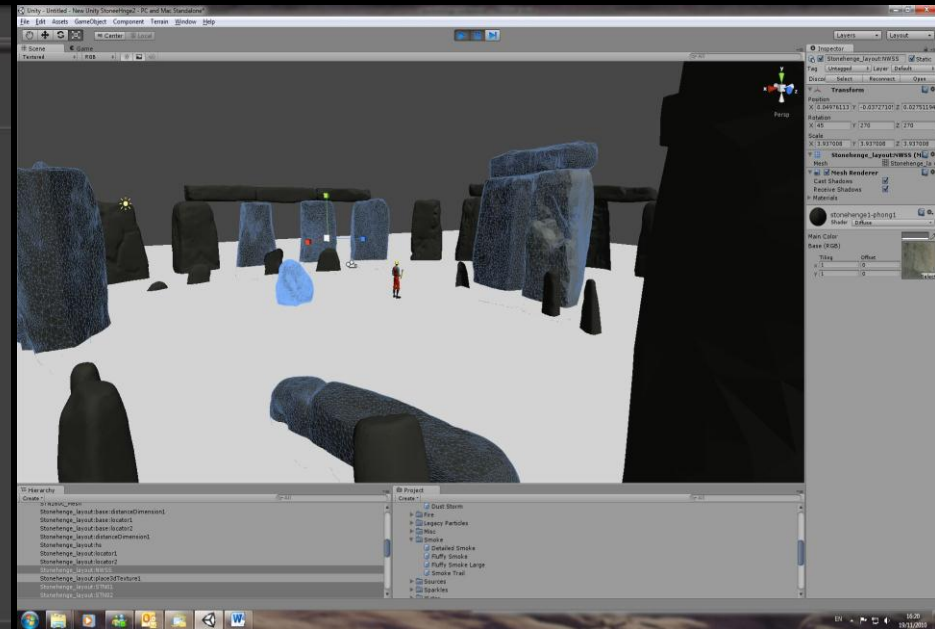
## Visual effects & Game applications



# Visual physics & Environmental effects (VFX): fire, smoke, rain and water



# 3D game environments & Interactive heritage applications



# 3D Digital Stonehenge

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# Conclusion

