Marvelous Designer and the Exodus - Recreating Ancient Clothing as a New Way of Experimental Archaeology
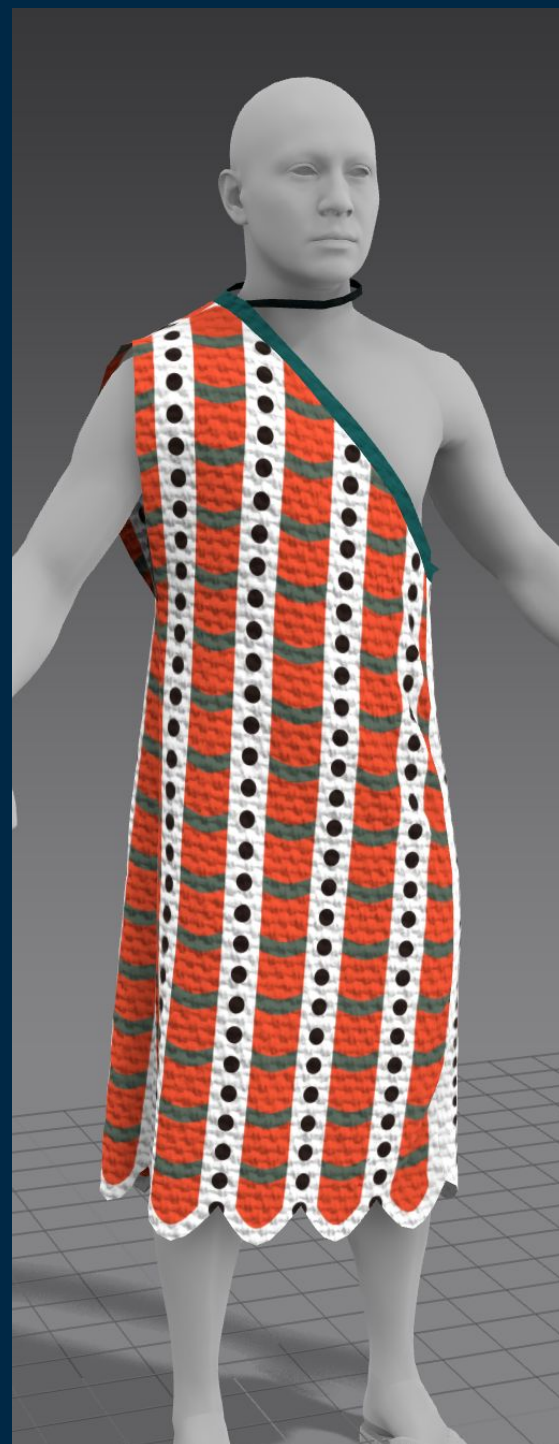
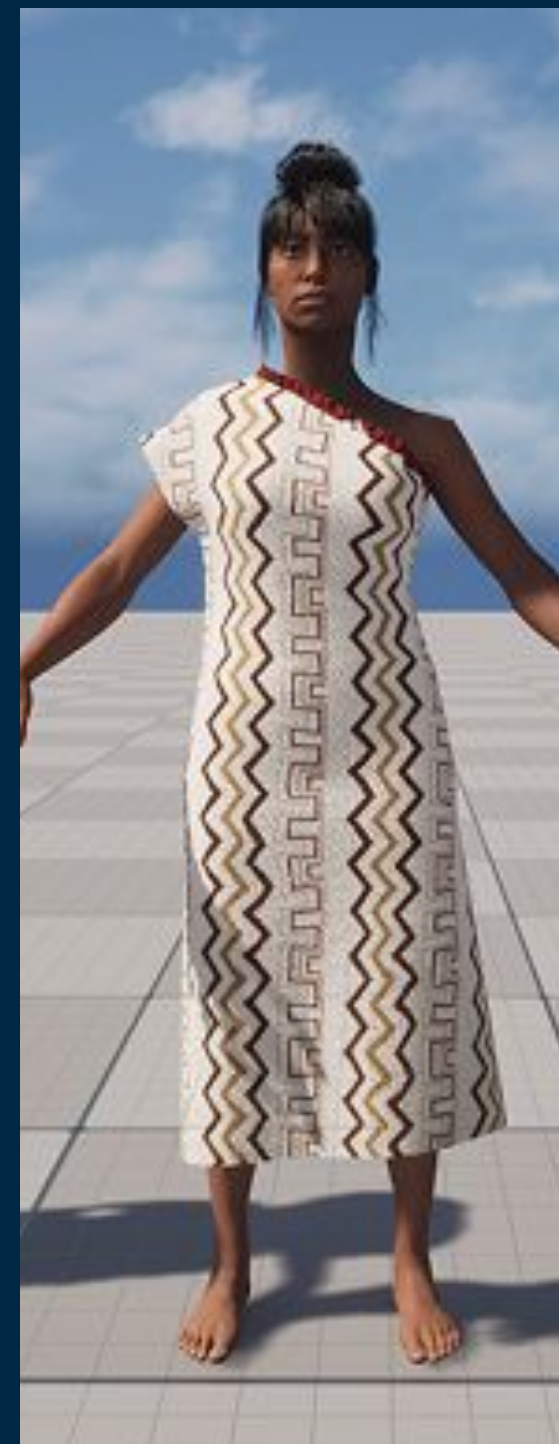Eva Intoci, Jeffrey Hata, Thomas Levy, Neil Smith

Introduction

The use of video game and 3D technologies such as Marvelous Designer and Unreal Engine enable more vivid and interactive representations of ancient clothing and historical events. Research on biblical era clothing can provide insight into the materials used, and clothing styles of different cultures. However, new findings that could apply to the study of historical clothing are often viewed through specific academic lenses such as art historical criticism or evolutionary anthropology.

There is also a wealth of ancient artworks that reveal the relationships between different ancient cultures including a vast library of tomb paintings found in Egypt. However, whether it be due to time, natural processes, or improper handling, many have been damaged leaving us an incomplete picture. This is why starting in the 1920s artists including Nina De Garis Davies have aimed to make recreations that infer a more complete picture. As technology advances, 3D recreations can give an even more vivid picture of how the garments would move and fit on the bodies of the people who wore them.

Applications

The first application of these garment recreations was in the EXODUS2 exhibit. This exhibition was a collaboration between experts in different disciplines including archaeology, biblical studies, computer science, and digital modeling. The clothing was displayed on metahuman models specifically made to be accurate to what asiatic people looked like in the biblical era. The models were then placed in a virtual museum environment alongside with the paintings their garments were based off of. Visitors in person could then view the exhibit in virtual reality, immersing themselves even further. Through the merging of 3D technologies with historical and archaeological research we are able to create engaging depictions of ancient clothing for this audience as well as fostering our goal of interdisciplinary research outputs.

Future Work

In the near future, we aim to apply this presentation of research within the world of video games. The Serious Games Lab is currently developing the Climate Games, a game in which the focus is on educating the player about the effects of climate change by exploring real world changing landscapes. Our goal is to implement the Marvelous Designer to Unreal pipeline to add these garments to the climate games in scenes focused on historical stories.

Male Shasu Garment

Female Shasu Garment

Marvelous Designer Pattern Window

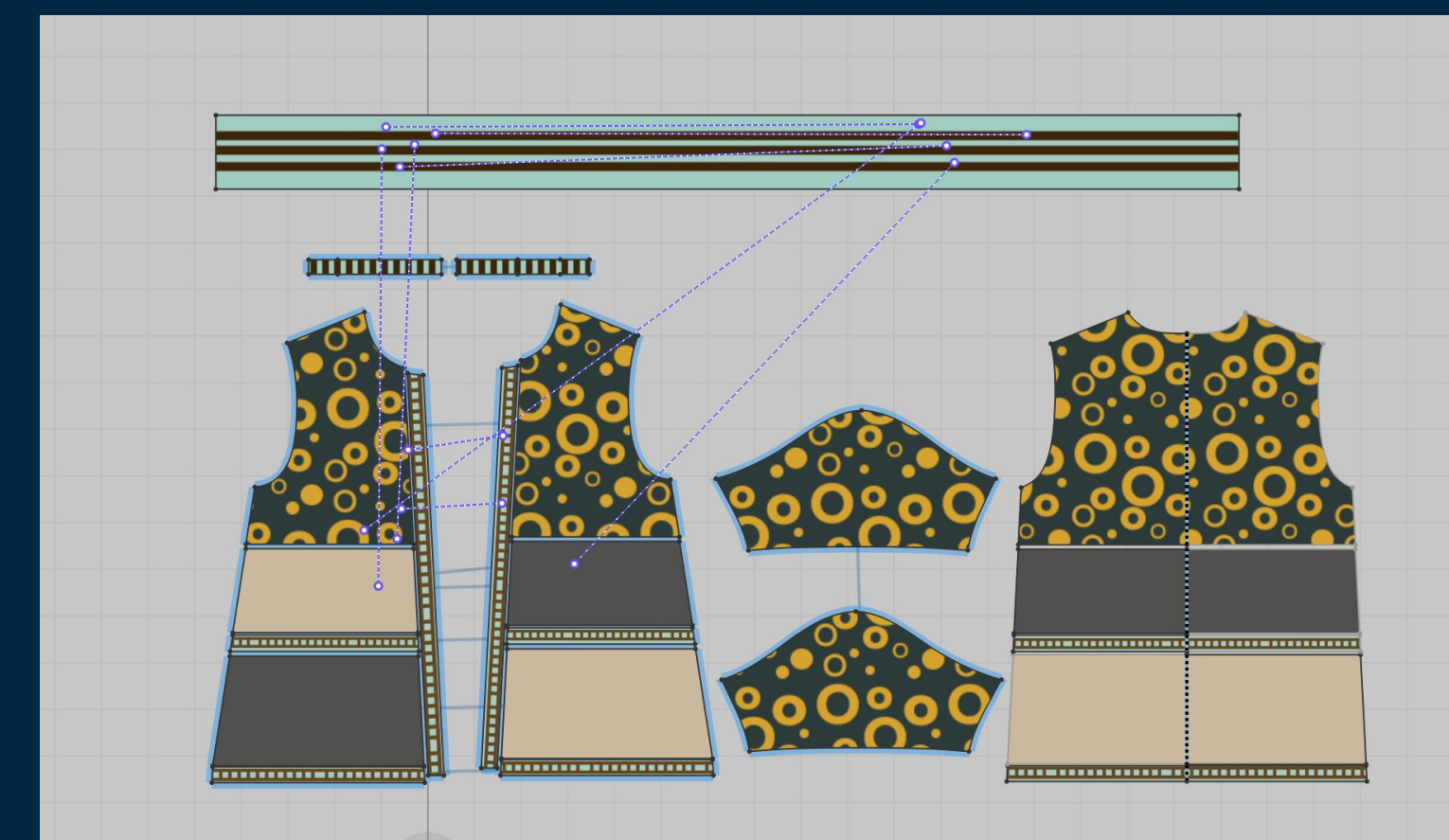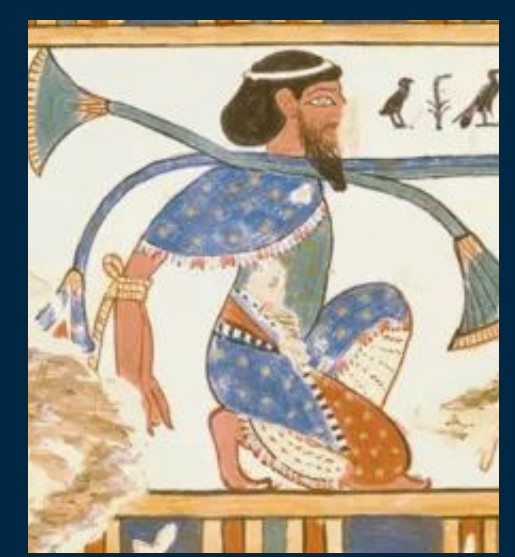Nina De Garis Davies and Recreated Tomb Painting

Approach

Our methods started with choosing firsthand evidence of a garment. Primary sources included tomb paintings like those at Beni Hassen, Egypt as well as recreation by Da Garis Davies. For the textures of the garments and tassels we referred to the research of Dr. Naama Sukenik on the dying and weaving techniques of the Shasu people. We then recreated the garments in Marvelous designer, filling in gaps in primary depictions with garments of the same period or ethnic group. This software created realistic draping and physics of the garment by taking into account the fabrics weight and thickness. Once the pattern was accurate to the paintings, we created the patterns in the fabric using Figma and made custom fabrics in Marvelous Designer. Lastly we used Unreal engine's, chaos cloth and metahuman plugins to put the garment on a model. Transferring the garment to Unreal Engine allows for the physics provided by Marvelous Designer to be even more visible with lots of lighting and weather adjustments. Using a metahuman model also allows for the model to have features that are fully customizable and the character can move and pose in a variety of ways while the garment deforms and moves realistically. With this process, the end product is a 3D animated garment and model that imagines who the ancient Egyptian painters were looking at when they documented the Shasu people.

Shasu Prisoner at Medinet Habu and Recreation

Shasu Exhibit at EXODUS2

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