Preserving Cultural Heritage: An Outstanding Students Digital Game Project On Lusíada Art

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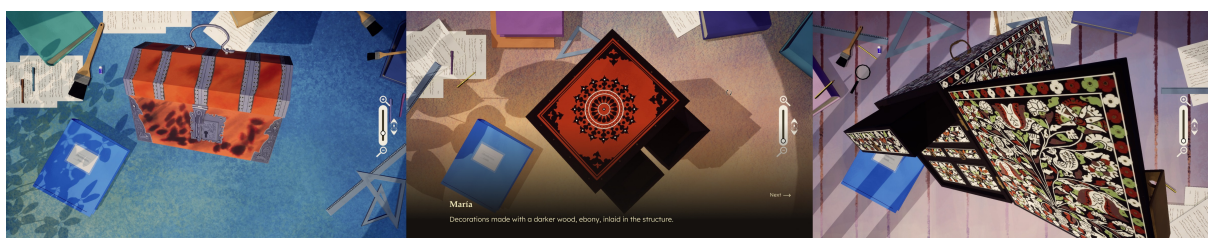

Figure 1: *Screenshots of the digital game Unseen Value, showing a casket and two cabinets of Lusíada Furniture.*

Abstract
This paper presents an outstanding undergraduate project that resulted from the development of a digital game focusing on cultural heritage and the value of works of art. This topic is addressed through the interaction with reliable representations of Portuguese Lusíada Art, a product of the cultural exchange between Portugal and many countries in Asia, during the Age of Exploration, during the 16th and 17th centuries. The resulting project provides an interactive and entertaining means to learn about the History of Art, by distinguishing different types of Lusíada Furniture.

1. Introduction

The usage of Computer Graphics (CG) to create digital representations of real-world objects has immense potential to contribute to the preservation of cultural heritage. Contrary to passive mediums such as encyclopedias or documentary films, several CG techniques enable the creation of interactive experiences, that provide users with more immersion and freedom. Augmented Reality and Virtual Reality are examples of these techniques, with benefits such as improved motivation, attention and learning capacity [MG22].

In greater detail, digital games are a great example that every year showcases the state-of-the-art of CG technologies. Usually, these are the result of a synergy between different types of media, that are combined to provide players with an interactive experience. Thanks to the existing technologies, digital games have become highly realistic experiences, capable of representing cultural heritage with increasing fidelity. An example is the Assassin's Creed game series, where landscapes, architecture, culture and traditions are represented for different locations and time periods [Ubi18].

This paper presents an outstanding student project in the format of a digital game, Unseen Value, which resulted from an assessment project of the Undergraduate in Games and Multimedia of the Polytechnic of Leiria, Portugal. The project corresponds to a digital game that teaches players about Portuguese Lusíada Art and the types of Lusíada Furniture, a product of cultural exchange that resulted from the presence of Portuguese people in several Asian countries during the 16th and 17th centuries. Additionally, this project won the Best Art and More Innovative Game in the Portuguese 9th Edition of PlayStation Talents awards and was nominated to the Best Student Game category of Spotlight Awards 2023.

2. Project Context

The outstanding project presented in this paper was developed during the second semester of the 2022/2023 academic year in the context of the "3D Game Project" course. This is a mandatory course, of 10 ECTS, that integrates the second year of the undergraduate program, whose main objective is to propose and create a vertical slice of a 3D game. These projects, which are divided into the three main components art, game design, and programming, are one of the opportunities that students have to follow an approach closer to the real workflow and methodologies applied in game development. Also, the project is developed in class, by groups of three students, with the mentoring of professors from the several components.

To complete their 3D games with success, students apply different knowledge and techniques from the art, game design and programming components. Regarding the art, these projects include 3D modeling, sculpting, and texturing, illustration, User Interface design, visual effects (VFX) shaders, and sound design. Game design is responsible for the rational game design [PC22] and player experience, level design, and narrative design. About the programming, this project considers the development of the mechanics and systems of the game, as well as editor tools that optimize the creation process. Additionally, all the components are assessed with users, using several games user research methods [DMBN*18].

Regarding the assessment, the course considers three oral presentations, which correspond to the pitch of the idea, the pre-production, and the production stages. In each presentation, students describe their process and the state of the game. The final presentation is complemented with the submission of individual reports, a game design document, user testing reports, among others.

3. Development of Unseen Value

Lusíada Furniture resulted from the adaptation of the furniture needed by the Portuguese, during the Age of Exploration, when they lived in the Asian countries (Figure 1). To make this furniture, they used the raw materials available there, such as mother of pearl, turtle shell and exotic woods. This adaptation resulted in beautiful and impressive furniture for European people, such as caskets or writing desks, but made with Asian materials and techniques.

Therefore, the main concern of the project was to realistically represent the Lusíada Furniture with 3D models. The concept and development of Unseen Value was mainly based on a book about expertise and identification of works of art [CdM06] and field work, that included a visit to the Cabral Moncada auction house and to the Portuguese Presence in Asia collection, available at Museu do Oriente, Fundação Oriente, in Lisbon [Fun24]. During these visits, the students could interact with and photograph true examples of Lusíada Furniture, which was highly relevant because of their many secrets, such as fake drawers and hidden compartments. To be able to teach about Lusíada Furniture, the game heavily relies on narrative. The story follows the fictional character Maria during her part-time job at an auction house in Lisbon, where she interacts with Lusíada Furniture with the help of the auction house owner. During this process, the two characters discuss the true value of works of art. The dialogue between the two characters was voice acted to create a livelier experience for the players. On their turn, the players interact with the game by finding interesting details around the 3D furniture, which brings new information, and fill in the correct classification for the current item in a notebook inspired interface. As the narrative progresses, new furniture is presented to the player, with different raw materials, shapes, and functions.

Regarding the employed technologies, the game was developed using Unreal Engine 5, and Blueprints for programming. The 3D assets, the furniture was created in Blender, based on photographs of the art pieces taken by the auction house, using Adobe Substance Painter to make the textures. For the 2D assets, such as the background and the UI, the students worked with Adobe Photoshop and Adobe Illustrator. Finally, the voice acting was recorded using a CM25 MkIII condenser microphone and Adobe Audition.

4. Discussion

This project demonstrates that digital games are a medium with great potential to contribute to cultural heritage preservation, through sensory-rich experiences with interactive features. Unseen Value resulted in a game that allows players to learn History of Art, more specifically Lusíada Art, by exploring reliable virtual representations of furniture created during the presence of Portuguese people in Asian countries during the 16th and 17th centuries.

Moreover, this project stands as an outstanding work due to the high-quality game achieved by the students. This excellence was the product of well-prepared field work and investigation on the studied topic, which allowed the students to create a reliable source of information. From the concept to the development, the process was meticulously documented and justified, in each of the three main development components. Also, the students relied on user testing to make several development decisions.

From the perspective of the students, this project allowed them to improve their skills in game development, by following the workflow and methodologies of real projects. Besides making a high-quality portfolio entry, Unseen Value allowed the students to engage in the game development community by participating in several Portuguese events, presenting their work and winning awards.

5. Acknowledgments

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