Paço de Sousa Monastery (Portugal): a case study of a 3D replica for tactile experience by visually impaired

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INTRODUCTION

Accessibility applies to strategies, actions, and resources created to eliminate physical barriers, but also intellectual or social ones, to allow the enjoyment of most people [1]. The aim of this proposal is to make known the work done in 3D of the monastery so that a tactile 3D model can be printed for people with visual impairments. Visually impaired people use touch as one of the main forms of object recognition [2,3]. Pharmacies are architectural spaces. In this context of disseminating the built heritage to people with visual impairments, the study by Valentina Rossetti (2018) and Barbara Leporini (2020) stands out. Presenting a project that aims to improve access to the architecture of cultural sites [4,5]. The digital patrimonial documentation [6] is an important tool for the realization of this project. We think that this approach could lead to the involvement of the target audience with the pieces through a multisensory experience, which will allow the audience to engage not only with the exposed pieces but with their history and origin. The elaboration process will be carried out in open-source 3D software. After the computational component, models will be printed in PLA or ABS as starting point. Properties as texture, weight, the temperature, among others, of the material will define the material for the final model. At this time is under decision.

CASE STUDIE

Conventual apothecaries had as one of their functions to serve the hospitals of the religious houses to which they belonged. However, they would also provide services to the lay community [7] One of the case studies is Barbosa Pharmacy founded in 1770. This pharmacy belonged to the Monastery of Paço de Sousa [8]. A monastery that would have been founded in the 10th century, and where a community of Benedictines (Order de São Bento) had resided. Its architecture is representative of the Romanesque style [7,9]. In 1834, with the extinction of religious orders, the pharmacy was acquired and installed in the village of Paço de Sousa. In 1994 it is donated to the Pharmacy Museum[10].
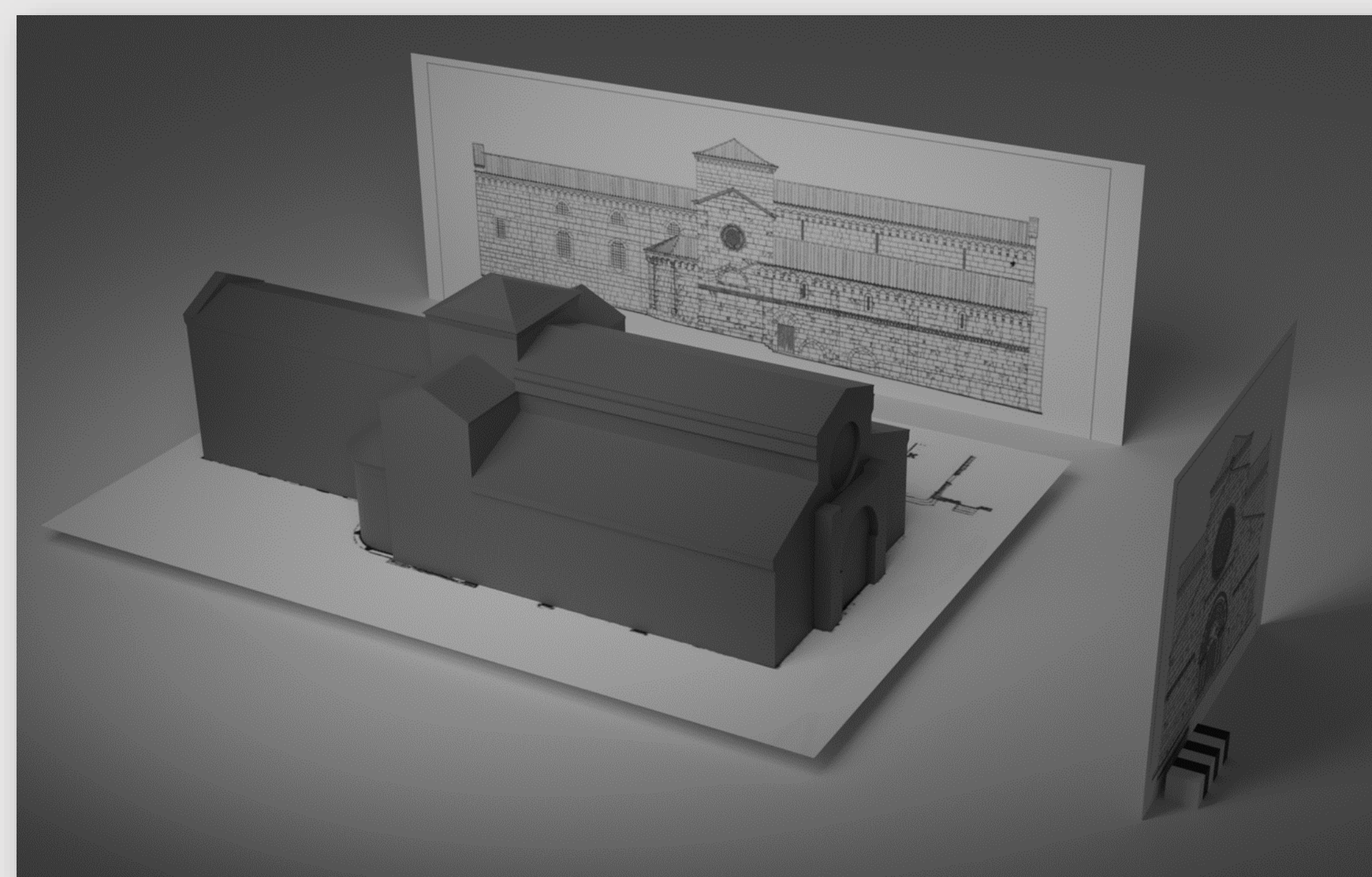

Vista do Mosteiro de Paços de Sousa (Penafiel - Portugal)

Available: https://pt.m.wikipedia.org/wiki/Ficheiro:Igreja_do_Mosteiro_de_S%C3%A3o_Salvador,_Pa%C3%A7o_de_Sousa,_Penafiel,_Portugal_(29291032761).jpg

**Barbosa Pharmacy (Pharmacy Museum, Lisbon, Portugal)**

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SCAN ME

3D MODELING

The digital patrimonial documentation [6] is an important tool for the realization of this project. For the realization of the model, reference images of the monastery are being used, architectural drawings (source: SIPA - Sistema de Informação para o Património Arquitetónico) for the construction of a virtual 3D model of the monastery. The elaboration process is being carried out in the open-source software, Blender®. This software allows the execution of modeling, animation, video editing, among other functions.
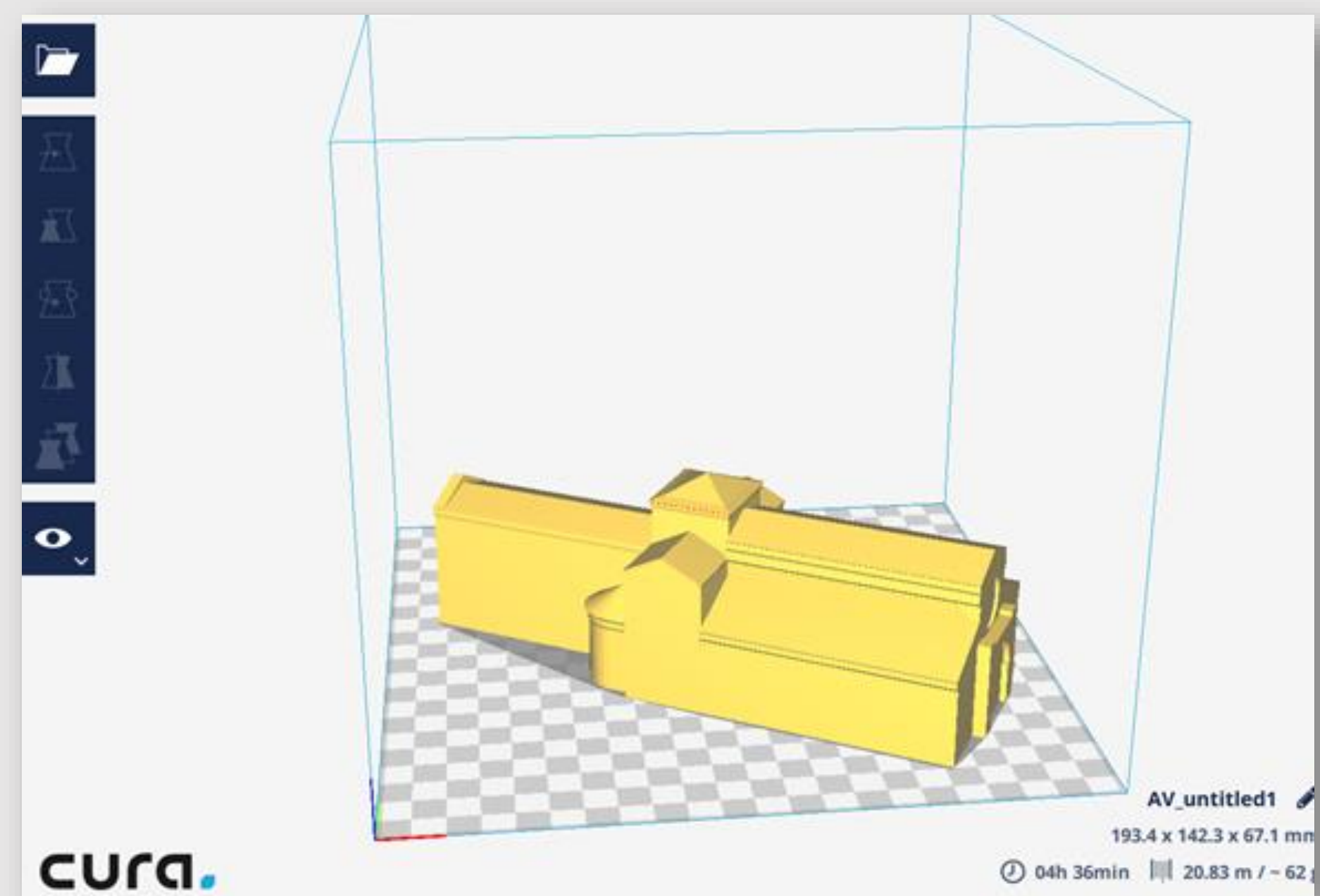
3D PRINT

Before the 3D printing process post-processing operations will be performed to optimize the models. We use the Meshmixer® software for that operation. After that the workflow is made with Cura®, to print the model. It is necessary to verify, through tests, in the context of the laboratory, which materials are most suitable for this purpose. With materials such as a lactic polymer (PLA) and acrylonitrile-butadiene-styrene (ABS) as a starting point.

CONCLUSIONS

Accessibility is an ample concept. Inserting this project within the scope of access to the contents and objects exhibited in the museum. In this way, with the development of tactile 3D models, the aim is to make known the objects and spaces of the pharmacy exposed in the pharmacy museum, as well as to create a tactile narrative of the history and context of the pieces. Something that is intended with this example of the Monastery of Paço de Sousa, place of origin of Barbosa Pharmacy.

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