Caserta Royal Palace: a heritage in network

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Abstract

Caserta Royal Palace in the aim of promoting its heritage has become a "playground" to experiment innovative technologies in 3D reconstruction, big data and sentiment analysis. Starting from the modeling of the "Terrae Motus" exhibition, the project aims at the creation of a "sentiment room" where it will be possible to browse all the digital contents, and sentiments, about the Royal Palace.

Introduction

Caserta Royal Palace started a challenging collaboration with Cineca, aiming to exploit the most advanced technology at heritage service. The starting points of this experiment were two: the setup of the temporary exhibition of the Terrae Motus Collection, and the sentiment analysis in the Royal Palace social networks streams.


Terrae Motus Blend4Web Virtual Exhibitor

The reconstruction of existing models needs many information in order to give as much details as possible and give in that way more realism at the virtual reconstruction.
First step was the definition of the 3d museological space, so the Caserta Royal Palace's rooms dedicated to the exposition. This reconstruction was driven by the existing CAD files of the buildings both floor plans and both sections for the volume of each room. This CAD files were based on the relief made by La Sapienza University and the government department responsible for the environment and historical buildings in 2005 by a team supervised by Cesare Cundari [1]. After the definition of the 3D space with the geometry every architectural parts needs to be textured in order to be refined and can give the required realism that helps user to identify a particular room of the exposition.The virtual exhibitor is a web application allowing interested people to experience the exhibit in an interactive videogame-like 3d visualization, directly within any web-browser, without the need to install any additional plugin, on any device like pc, tablet and smartphone. The technology behind the Exhibitor is based on

Blend4Web [2] : an effective tool that allows to export Blender contents to web pages, and provides a state-of-the-arts WebGL rendering capabilities, as well as sound support, animations, and scriptable user interaction.
In order to support even less-powerful devices like entry level smartphone, Blend4Web provide a set of quality-profile setup, and automatically chooses the one more appropriate.

The second part of the work was the reconstruction of the definition of what will be the paintings, statues or peculiar installations to be put inside the 3D space.
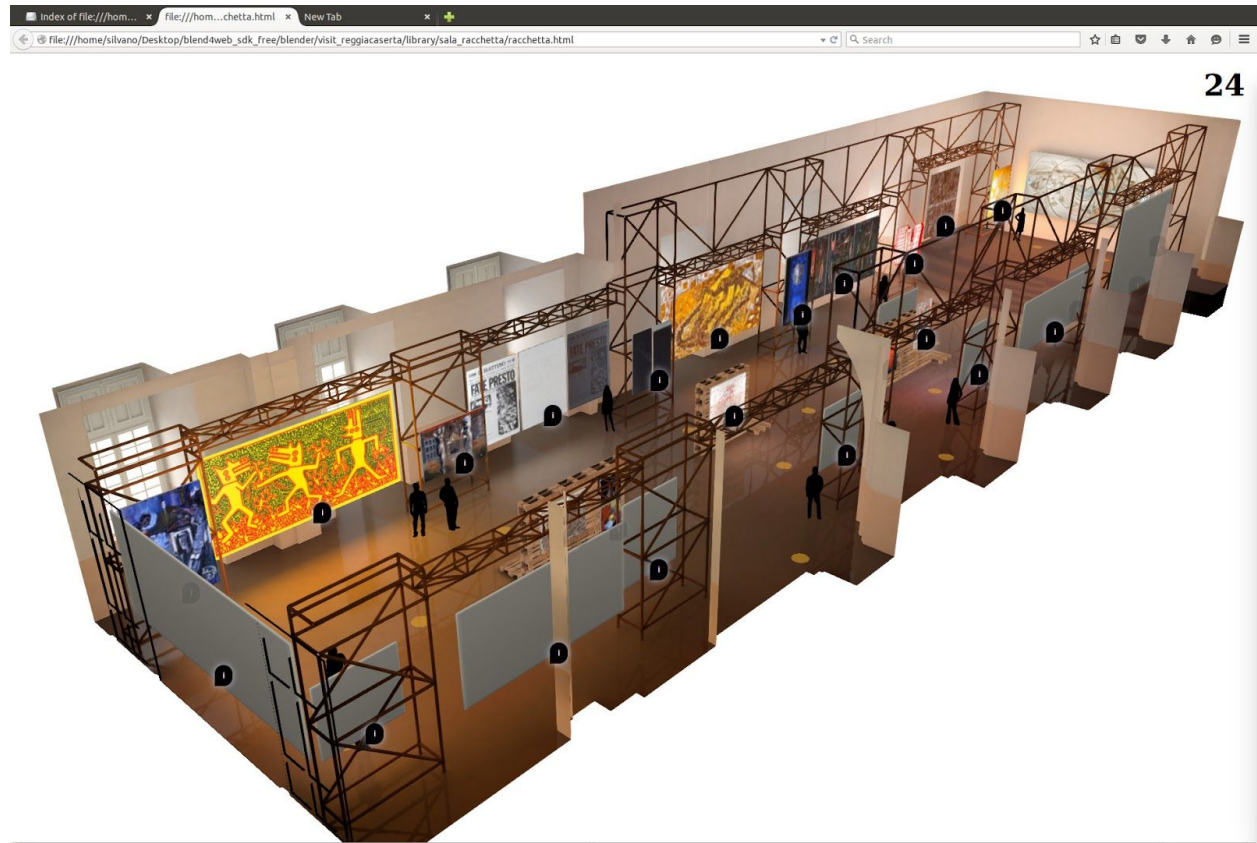
Picture 1: Virtual Exhibitor: Sala della Racchetta 3D model

The expected use of the dynamic 3D model built in this project is to be an operative aid in planning exhibitions. Having the gallery's realistic 3D model, and the database of the objects to be shown, the curator can dispose the work in the space, on the wall, or imagine the building of a separator that can be set up very fast in the 3D model, to have the taste of the exhibition, and arrange, rearrange and perfect the exhibition in the desired way.
Since now the temporary exhibitions documentation was represented only from the catalogue of the exhibition itself. Building a 3D model of temporary exhibition gives to all the cultural institution a more performant documentation of the exhibits, providing also educational material for museum studies and researchers. But the consequent use of this 3D model is to better communicate the exhibition on the web.
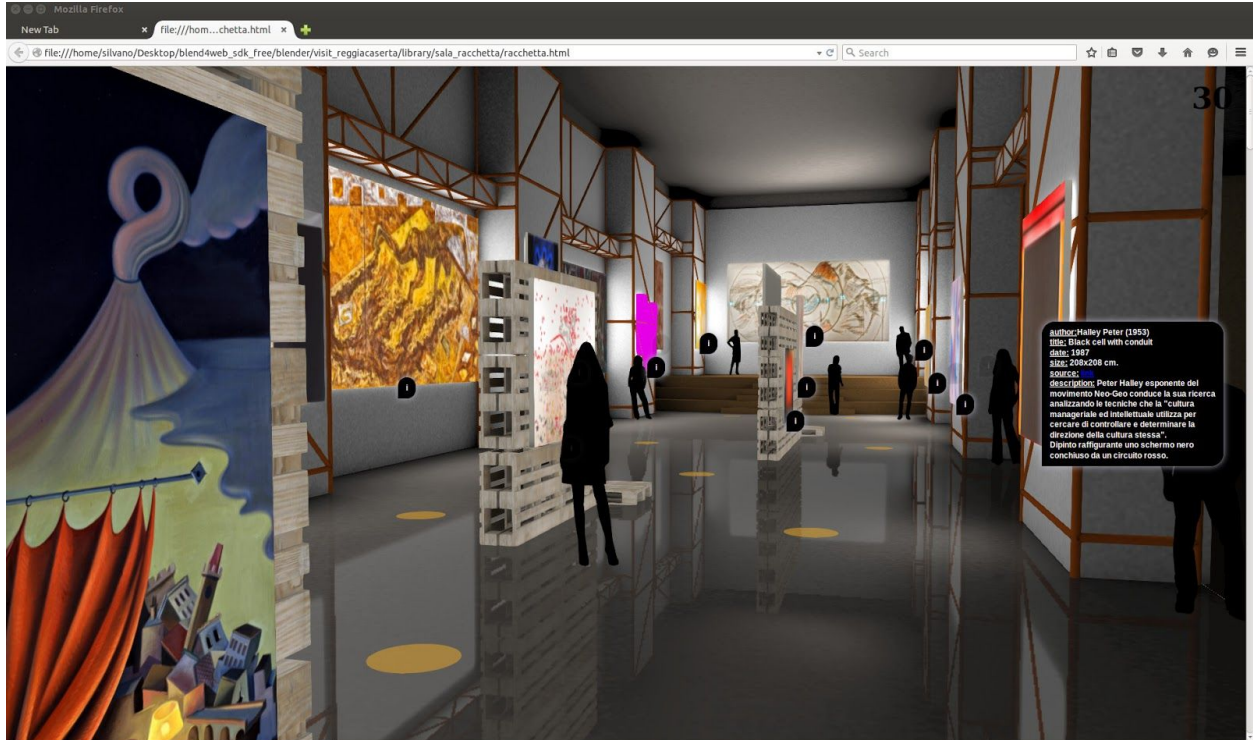
Picture 2: Sala della Racchetta, Terrae Motus detail of the exhibition

Sentiment Analysis

Tourism has become more and more an emotional experience than a simple trip. An understanding of the ways in which tourists experience the places and people they visit is fundamental to the study of the conception of tourism. It is not surprising that attention has long been paid in the tourism literature to particular perspectives on the tourist experience, including the role of new media in providing the image and perception of the Caserta Royal Palace. Facebook, Twitter, TripAdvisor and more generally all the social networks are the new online *word of mouth*. Decipher emotions, opinions and judgments that lie behind a post or a tweet is the real value added of these sources of data. Not always a greater number of post / tweet must be considered as positive. The main goal of Sentiment Analysis is to determine whether the expressed opinion in the text is positive, negative or neutral. We analyzed 7,500 Facebook users that from 2012 to August 2016 have posted / commented more than 17,000 content; more than 10,500 Twitter users that from March to August of this year have tweeted almost 25,000 times; nearly 3000 Tripadvisor reviews for a total of 45,000 interactions. An amount of 227,000 words has been analyzed and classified.

The main result is that The Royal Palace of Caserta is objectively beautiful in the perception of its visitors.

Tourists (potential or actual) develop an overall positive sentiment of 71/100. Facebook reaches a value of 83/100 while Twitter is more sensitive to facts and events that influence negatively on the indicator (59/100).

We testify good results for activities and events (88/100), hospitality (76/100), location (64/100) and accessibility (60/100); what people expressed has to be improved are the catering (48/100) and the prices (37/100).

Picture 3: Caserta Royal Palace sentiment analysis tag cloud for May 2016

Conclusions and further development

What we have presented in this paper can show very few points of integration, but the big picture that is at the basis of the agreement between Caserta Royal Palace and Cineca is different. The 3D model of the location of Terrae Motus Exhibition is only the start of the 3D model of the whole Palace, that will be integrated with: infrastructural data, such as electricity cables, water pipes and services, surveillance camera data and details about the statues, paintings and other artworks shown in the Palace, with metadata of description, in a complex BIM model, enriched of heritage information. This 3D model can be used in a sort of "sentiment room": a room with screens that show the real time picture of the function of the building, according also on the overall sentiment that people have of the Caserta Royal Palace: live tweets, likes and comments on Facebook, pictures on Instagram, opinion on Tripadvisor.

1 C. Cudani (ed.), "Il Palazzo Reale di Caserta", Roma, Edizioni Kappa, 2005
2 https://www.blend4web.com/en/