# The *Marcus Caelius* Project: a transmedial approach to support cultural communication and educational activities at the Civical Archaeological Museum of Bologna

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**Resumen**

*El proyecto de "Marcus Caelius, el valor de la memoria" es una breve película de animación de 8 minutos ambientada en la Bolonia romana (Bononia) durante el periodo del emperador Augusto, que surge de una iniciativa del Museo Arqueológico de Bolonia, en colaboración con Cineca. Este proyecto, basado en un famoso hecho histórico (la batalla de Teutoburgo), quiere proponer un enfoque filológico dentro de un proceso emocional/narrativo, definiendo una pipeline de producción apropiada (que incluye renderizado de Blender, Chroma key y animación Machinima) para definir tiempo y costes que puedan ser cubiertos por un pequeña producción. Nuevas reconstrucciones filológicamente adecuadas (restos arqueológicos en la Colección del Museo), se integran dentro de sets en 3D que proceden de proyectos anteriores de Cineca.*

**Palabras Clave**: *EDUTAIMENT, MUSEO VIRTUAL, REPOSITORIO3D, TRANSMEDIALITY, REUTILIZACIÓN*

**Abstract**

*The project "Marcus Caelius – the Value of Memory" is a 8 minute short animation movie located in the Roman Bologna at the Augustan Age. It originated with the Civical Archaeological Museum of Bologna in collaboration with Cineca VisIT-Lab. The project emploies a well known historical fact (the Battle of Teutoburg) to enable a philological approach within an emotional/narrative process. New philologically accurate reconstructions (i.e archaeological finds hedged in the Museum's collection) are integrated with 3D historical sets caming form previous Cineca projects. Mixed movie-making techniques, such as Blender rendering, Chroma key and Machinima animation, implemented an ad hoc production pipeline in order to define times and costs which could be supported by a small production.*

**Key words**: *EDUTAIMENT, VIRTUAL MUSEUM, 3D REPOSITORIES, TRANSMEDIALITY, REUSABILITY*

## 1. Introduction

The project "Marcus Caelius – the Value of Memory" is a 8 minute short animation movie located in the **Roman Bologna** at the Augustan Age. This project originated with the Civical Archaeological Museum of Bologna and involved the skills in Virtual Heritage gained by Cineca with VisIT-Lab projects (BORGATTI, 2004: 30). (*www.comune.bologna.it/museoarcheologico*) (*www.cineca.it*)

Starting from a well known historical fact (the Battle of Teutoburg), the story is a ploy to intrigue the largest number of people (with different ages and background) in order to prompt them to discover items seen in the movie within the museum itself.

This aim raised a twofold challenge concerning both communicational and reusability issues.

From one hand, edutainment products increasingly rely upon storytelling in order to catch the audience interest. When joined to CG applications, this solution risks to make costs unbearable, in particular for museums always struggling with expense cuts.

An opportunity can come from reusing three-dimensional reconstructions already submitted to a rigorous historical or archaeological validating process.

Up to now Cineca is storing many three-dimensional philologically-accurate historical and archaeological reconstructions coming from projects of the past with the University of Bologna, with CNR ITABC, with the Cultural Department of Bologna, the Civic Museum and recently with the Genus Bononiae cultural heritage project (DELLI PONTI, 2011).

The Open Source consolidated approach adopted by Cineca for Virtual Heritage projects allows historical and archaeological assets to be reused as open contents in future upcoming projects. It is a transmedial experiment which is included into the Workpackage 5 of VMusT, a new European Network of Excellence dedicated to Virtual Museums (*www.v-must.net*).

On the other hand, the peculiar production pipeline especially designed for this work take advantages from mixed film making techniques, such as Machinima and chroma key animation, in order to preserve graphic quality while defining times and costs which could be supported by a small production.

The reminder of this paper is structured as follow: Sec. 2 discusses the way in which cultural communication is pursued. In Sec. 3 the mixed production pipeline is related. Finally we give some conclusions and we will point to future developments.
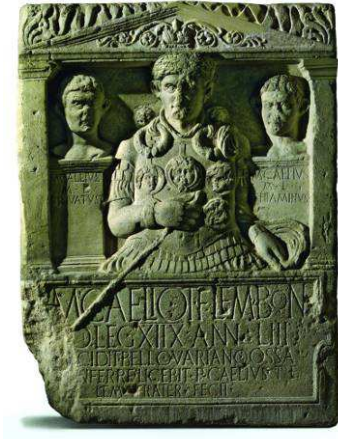


*Figure 1. Marcus Caelius' stelae.*

## 2. Story-telling for cultural communication

This work enables a philological approach within a narrative process. 3D models and computer-based visualization methods can help people to be more active in visiting a museum and to correctly interpret items on the basis of their original meaning, thus reaching a new audience (ANTINUCCI, 2010).

The movie is a mean to divulge historical and archaeological contents in a way which aims to be attractive for the largest number of people (with different ages and background), especially for the youth who are often inattentive on museum tours.

The concept comes from a well known historical fact occurred in 9 AD, the *clades Variana*, the Varian disaster**,** or **Battle of Teutoburg,** when three Roman legions, led by Publius Quinctilius Varus, were ambushed and destroyed by Germanic tribes, during the expansion northward of the Roman empire. The event was handed down by the historian Tacitus and by a **burial monument in memory** of the centurion Marcus Caelius, from Bologna, conserved at the Museum of Bonn (Figure 1).

The plot is just around Marcus Caelius and tells the moment when his brother Publius become aware of the military defeat and of the death of Marcus.

## 3. A transmedial approach

If a 3D reconstruction requires time and a large amount of human work, it can lead to many visual 3D experiences employing the same model (or causing just some changes). The project followed this idea and pursued a new communicational aim for the procedural reconstruction of the Roman Bologna (i.e. Bononia) at the Augustan Age created by Cineca/CNR for

"Apa the Etruscan and 2700 years of Bolognese History", a 3D stereoscopic movie for the Museum of the History of Bologna (*http://www.v-must.net/virtual-museums/vm/genus-bononiae*).
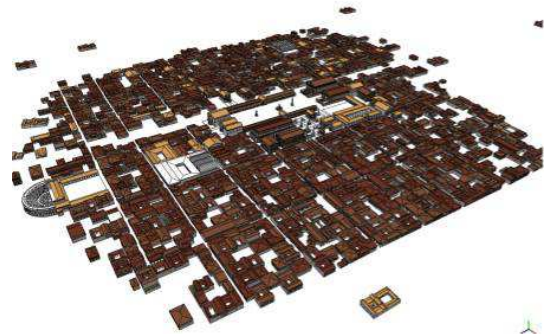


*Figure 2. Three versions of the 3D historical reconstruction of the Augustan Bononia created by Cineca/CNR: the procedural reconstruction by CNR, the model employed in the Apa project and the one employed in the Marcus Caelius Project with different communicational aims.*

A comparison between the different emotional approach for the Augustan Bononia reconstruction is shown in Figure 2.

A reusability approach can be especially suitable if models have been submitted to a rigorous historical or archaeological validating process (YOUG, 2011).

Along this path are currently going the efforts displayed at Cineca for creating a 3D repository (Framework WP4 for V-Must Virtual Museum Transnational Network www.v-must.net), and the Marcus Caelius project was in the position to take advantage of the procedural reconstruction of the Roman Bologna (i.e. Bononia) at the Augustan Age, recently created by

Cineca/CNR ITABC for "Apa the Etruscan and 2700 years of Bolognese History", a 3D stereoscopic movie for the Museum of the History of Bologna (*http://www.v-must.net/virtual-museums/vm/genus-bononiae*).

The shared model (i.e. Bononia) was added with objects coming from the collection of the Archaeological Museum of Bologna (in fact, their valorization is one of the aims of the project), as well as with sets, which were especially modeled for the movie.

It is worth noting that the modeling task, as time consuming as it is, is just a fraction of the effort required in creating and animating virtual characters. The solution has been found in a mixed use of heterogeneous movie making techniques, such as Blender, Chroma key and Machinima animation.

## 4. The mixed production pipeline

As already mentioned, we were interested in having a strict scientific accuracy with a notable graphic quality for the final product, while defining times and costs which could be supported by a small production. So sets are integrated with archaeological finds hedged in the Museum's collections in order to enable spectators to compare real and virtual. As an example, see the Blender screenshot shown in Figure 3.

In the same way, the design of characters, most of which are truly documented, reckon with attitudes, rituals and social customs of the Augustan Bologna. As a result, this work required a continuous check by historians and archaeologists to create new models (props and locations) which are as rigorous and fair as possible and to integrate them within the procedural models of Roman Bologna.

The *pipeline* production has been developed to specially address such challenges. So we selected heterogeneous movie-making technologies which sometimes are often used in discordant contexts: Blender rendering, Chroma key compositing and Machinima animation.



*Figure 3. An example of the modelling process for archaeological find hedged in the Museum's collections: the original position of the object in the Museum, a Blender modelling screenshot with a Blender rendering, and the object in a shot.*

Blender, chosen at Cineca as part of its effort in promoting Open-Source tools, is a single product similar to other 3D tools such as 3D Studion Max or Maya, which allowed us both to reconstruct sets and props with a particular accuracy in shape and materials, and to integrate assets developed in previous projects, i.e. the Roman Bologna.

Blender capability of exporting its output into a wide range of different file format enabled the acquisition of heterogeneous movie-making technologies such as Chroma key e Machinima animation into the production chain.

Furthermore, the Blender Open Source feature entered in the process many benefits which Cineca has been able to experience in previous projects, such as code availability, great compatibility, scripting customizability and a rich developers community, which not only supports problem solving, but also entails an Architecture of Participation that O'Reilly points out as a more representative property for the Open Source model today, than in fact the source availability (O'REILLY, 2003).

Virtual worlds (i.e. Metaverses such as OpenSim or Second Life, and game engines such as the Sims 3 by EA) and modding tools delivered by communities, such as The Sims, can limit time and costs relating to characters modelling and animating tasks, while assuring a scientific accuracy with a notable graphic quality for the final product. Avatars (i.e. Virtual characters) will be employed as actors in the virtual world.



*Figure 4. The Sims 3 screenshot for avatar customization as an ancient roman of the Augustan Bologna.*

Two worlds (Second Life and the Sims 3) have been taken into account for this project and a chroma key test has been checked within The Sims 3 machinima game engine. This software allows users to customize characters with a high degree of accuracy (Figure 4) and to make them acting as in a real set thanks to the process termed machinima (i.e machine cinema). The use of such sets avoids the phases of modelling, animating and rendering the characters and their actions, required instead with a 3D software such as Blender, since the scenes are shot directly inside The Sims' environment. As an example, the machinima can be performed in chroma key: avatars plays inside the scene on a monochromatic green or blue background.
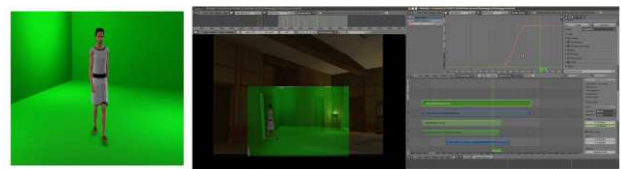


*Figure 5. A Blender screenshot of the chroma key editing performed as a test to verify the capability of compositing The Sims 3 machinima animations and Blender rendered sets.*

This makes possible to add animation with locations rendered with Blender. The compositing between the The Sims 3 machinima animations and the sets is realized by Blender itself, which enables chroma key editing. A screenshot of our test is shown in Figure 5.

## 5. Conclusions and further work

This work related the pipeline production for a 3D 8 minutes short movie as an edutaiment product which used a mixed pipeline production in order to enable short productions such as Museums.

At the moment, Blender reconstructions have been accomplished, while animations will be performing in the remainder of the project. We already tried a test which confirmed the high level of quality which can be reached, while maintaining low time and rendering costs. The capability of compositing The Sims 3 machinima animations and set rendered with Blender is realized by Blender itself through chroma-key editing, as shown in Figure 5.

The innovative production pipeline so developed can lead to a fair cost reduction and an active involvement in creating new stories or characters by younger people (machinima modders world). It is worth noting the current involvement of a student who entirely realized the soundtrack. As a further work, we are planning to add subtitles and dubbing in Latin language, as well as to realize a comic book based on the storyboard, in order to enhance the transmedial approach. Of course, the models realised for this production will become part of the aforementioned 3D repository which is going to be developed for the area of Bologna by Cineca and Comune di Bologna (Bologna City Council). The projects suggests an Open Data approach in order to make 3D philologically accurate reconstructions available for a creative reuse in order to support and stimulate transmedial story-telling such as started with Marcus Caelius project.

## Acknowledgements

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