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*The rebirth of a Roman Forum -  
The case study of the Flavian Forum of Conimbriga*

### *1. Introduction*

Since the Middle Ages, perhaps even before, the questions related to the historical and cultural past, mainly to the level of archaeological findings, have exerted an enormous and mysterious allure on Man. Ever since then, Man has come up with methods and forms to recreate such places, in order to satisfy this recognized natural and ancestral curiosity associated to the human being.

Mainly in these last few years, the rise in the number of projects involving this thematic (historical reconstruction), has been real and effective, due to two main factors: the increasing technological development that allows such designs to be accomplished more easily, with a larger impact, affecting a greater number of people; and the continuous and increasing interest of humanity in these questions related to its cultural and architectural patrimony. This is the reason that legitimises the work presented in this paper.

### *2. The Flavian Forum of Conimbriga*

The twelve campaigns of excavations, carried out between 1964 and 1971 in the ruins of Conimbriga by the French Archaeological Mission in Portugal and the Monographic Museum of Conimbriga, led, in particular, to the discovery of the foundations of the former Forum in this ancient Roman city. The Flavian Forum of Conimbriga was built between the years 75 and 80 AD, by the municipality during the reign of Flavius Vespasianus dedicated to the Imperial Cult. The architectural revolution took place with the destruction of some existing monuments of the Augustus era, which led to the creation of an Imperial Forum. For such, nothing was left to chance: since the subtleness of the mathematical proportions of the dimensions, to the relation between covered spaces and free spaces [Alarcão94].

Three monuments composed the Flavian Forum of Conimbriga: The temple, the porches of the temple and the porches of the Forum (the square). The temple of the imperial cult was raised in the highest point of the city, precisely in the middle of a sacred area. This location and its characteristics confer impressive dimensions, as was originally desired. This entire sacred area was surrounded by a porch whose function was essentially architectural. The square, the only monument that remained from the Augustus era, was the civic place par excellence. Its two lateral porches were placed at an inferior level relatively to the porches of the temple and the floor was now covered with a meticulously lined up pavement.

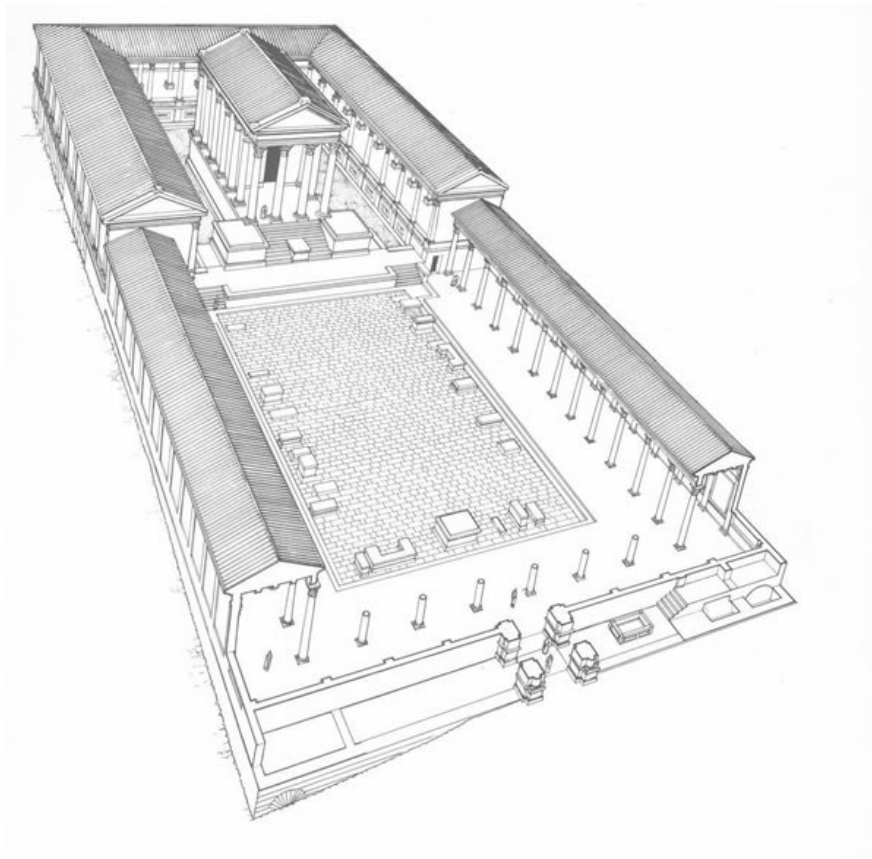


Figure 1 Image of the Flavian Forum of Conimbriga

### 3. The reconstruction

In 1899, Queen D. Amélia gave orders to initiate the archaeological excavations in Conimbriga, but it was after 1930 that these excavations had been complemented and deepened, in such way that they show undeniable vestiges of a city constructed by the Roman civilization. The amount and quality of the archaeological findings presented an architectural and cultural capital of such order that it was considered to put available to the general public the contact with such reality, significantly distinct to the present.

Any visitor of this space, when facing the scene of buildings in ruins, degraded floors or damaged columns, unconsciously is led to an imaginary time travel, where he tries to recreate, through the set of sensations assimilated at that moment, all the urban, social and architectural environment lived at that time. Given the distinct ability of abstraction of each human being, even based on drawings and blueprints, this task of imaginary recreation will be always full of flaws due to the individual interpretation of each one, which can vary with the mood, age or even the cultural level of each person.

The work developed in this project, and now presented, had the main purpose to make it possible for everyone to pay an interactive visit, although virtual, to one of the most emblematic places of the cities of the ancient Roman Empire, the Forum, which, in our case, was the three-dimensional recreation the most reliably as possible (from the number of steps of staircases to the number of columns, patterns of the time, colours, etc.) and at real scale, of the Flavian Forum of Conimbriga [Gonçalves02].

#### 3.1 The technology

Having in account the characteristics of the project and the main goals, the technology to use would have the capacity to achieve good visual results, but at the same time to supply to the author the necessary potentialities to carry out an efficient development. The choice was the *Virtual Reality Modeling Language* (VRML), a language that allows the creation of virtual environments, and that allows users, now converted into visitors, to explore the reconstructed spaces simply by moving a mouse.

Since VRML is the Web standard for publication of three-dimensional contents, the range of potential users will certainly grow when placing the reconstruction of this historical relic on any Web server, where now somebody in any part of the planet will be able to make, without great difficulty, a trip in time and to visit one of the monuments of the ancient Roman Empire.

### *3.2 The working tool*

To carry out this work, we use a tool that operates natively with the VRML, the Cosmo Worlds 2.0 from Silicon Graphics. This tool allowed us to perform a supported and gradual development of the project. Its characteristics and potentialities, was one of the responsible items for the final results.

### *3.3 Historical accuracy*

In this type of historical reconstructions, the question of scientific veracity of the architectural model to use is always argued and the cause of deep analysis. There are situations where the lack of consensus between investigators causes the presentation of more than one proposal for the model of the space or area to recreate. In the case of the Flavian Forum of Conimbriga that did not happen. The excavations concluded in 1971, culminated in the attainment of trustworthy blueprints of nearly the total area of the architecture structure of the Forum.

In this way, it was the blueprints elaborated during that period and gently yielded by the head of the Monographic Museum of Conimbriga, our base of work for the “rebuilding” of the Flavian Forum. The implementation of this work was, consequently, made solely with these blueprints, with the observation of the Forum ruins and the access to some of the removed fragments of its original construction.

We would like to refer that this work would not have been possible, without the direct contribution of the Monographic Museum of Conimbriga, mainly its Director, Dr. Virgílio Correia.

## *4. Main characteristics*

Here are some of the main characteristics of this work:

### *4.1 Realistic model and up to scale*

It has already been said that the modelling of the Forum would be true to the original building and would be materialized to the real scale, which allows for:

- The possibility to visit to the Flavian Forum of Conimbriga in the perspective of an inhabitant of that period, and thus have a real perception of the colours and forms of the architecture of the ancient Roman Empire;
- And simultaneously, from that same perspective (about 1,70m high), give the visitor the real magnitude and impressive surrounding area of the Forum: the high and imperial temple with its colossal columns; the beauty and symmetry of the porches of the temple, whose sections we can now visit, something not very easy to do for the local inhabitants [Alarcão94]; and finally the enormous square of cult and knowledge, where the society met for their discussions.

It was the experts, mainly the Director of the Monographic Museum of Conimbriga, who approved the realism of our reconstruction in comparison to the building constructed in the 1<sup>st</sup> century.

### *4.2 Interactivity*

Another main characteristic of this work is related to its interactivity. We intended to create a virtual space where the visitor (the user) could have a complete autonomy of movements in the area of the Forum, which means, he can go where ever he want, following the path he chose, by using an interaction device (keyboard or mouse).

### *4.3 Guided Tour*

Beyond the total liberty of movements and preventing eventual low levels of agility and dexterity in handling the devices that permit to simulate the movements in the 3D space, we also created a version with a guided tour that shows all the monuments that constitute the Flavian Forum of Conimbriga.

#### *4.4 Easy to use*

Whoever decides to visit the virtual space of the Forum, will be presented with another feature of the virtual worlds elaborated in VRML: it is very easy to use. Simply pressure the directional keyboard keys or click and drag with the mouse, and any layperson in the matter will be able to move himself in the virtual space without any difficulty. All the movement are made in order to give the visitor a realistic perception of what was physically really happening to him, such as the notion of climbing stairs or falling off a high place.

#### *4.5 File dimension*

This was without a doubt, one of the main achievements of this work. Due to the optimisation techniques used in the elaboration of the project, we were able to obtain a very small file size of the files needed to generate all the visualization. For example, the main, and only, VRML file has approximately 22Kb. It is possible to store many copies of this work in a small and almost obsolete floppy disk, and practically without losing any of the realism obtained.

#### *4.6 Performance*

Still due to the optimisations made in the elaboration of this work, and because this is a problematical item in the viewing of three-dimensional spaces in a low end PC, the performance of this virtual space is fully satisfactory in any current domestic equipment.

#### *4.7 Accessibility*

The access to some of the projects, namely the ones that involve the use of Virtual Reality techniques, is normally restricted and limited, in virtue of the specificities used in its development and/or its visualization, that in general unable the presenting of this kind of projects to the wide public, for example over the Internet. Our work does not follow that tendency, as it is precisely in this area, accessibility aspects, that it differs from almost the totality of the known works of this kind.

And for this fact, much have contributed the two last points presented in this paper (4.5 and 4.6). Due to the language used, the VRML, and the results of the optimisations made, all the care placed in the search of a good balance between realism, performance and files dimensions, resulted in a final file of reduced dimensions, easy to download and with a good performance in any recent computer. Therefore it can easily be accessed by any person using the Internet.

This work can be seen in: <http://lsm.dei.uc.pt/forum/>.



Figure 2 View (in greyscale) of the main entrance of the Virtual Flavian Forum of Conimbriga

#### *4.8 Cost of the project*

This is a type of work that is not very expensive, financially speaking, in contrast to others with similar objectives, namely the conception and the time required to implement it or the tools to make it possible (in VRML), where, for instance, all the applications needed to the visualization are available for free.

Even after its conclusion, it is possible to make improvements to the realism of the recreated space, without any alteration in the VRML file. For such, a simple improvement of the textures used in the scene, automatically updates the visualization.

#### *5. Conclusion*

The last years have confirmed an increasing concern, mainly of great institutions such as UNESCO or the European Union, with the preservation, interpretation and spreading of the historical and cultural legacy of our ancestors. Such fact originated a new wave, where the use of new technologies, namely of Virtual Reality, acquires a larger role in the achievement of such intentions.

The Flavian Forum of Conimbriga supported the work presented in this paper, which aimed to recreate with accuracy, in a virtual way, this impressive but disappeared monument. This is a work, which was only possible due to the effort of the archaeologists and historians, and intends to be faithful to the reality of the monument and the drawing of its creator. Moreover, it constitutes a way to allow the great public to contact this monument. The interactive three-dimensional representation allows a deeper contact, better than any drawing or written description. The work has thus a double function: a pedagogical and social one; therefore it enables the “reading” of the past to some levels and it assures the transmission of the culture. And since anyone, with no exception, can access it, this work contributes to a true democratisation of knowledge

Thus and for the accomplishment of this design, all the area belonging to the Flavian Forum was modelled three-dimensionally (with exception of the interior of the temple) to the real scale and always with a special care in preserving its geometric characteristics, so that the historical precision, always essential in these situations, is unquestioned.

This work also intends to contribute, even if modestly, to the spreading, preservation - by preservation we also refer to the recreations by scale models, drawings or virtual representations of spaces forever lost - and better knowledge of a past, which is important for both the historical interest and the values that the Flavian Forum of Conimbriga represents.

#### *6. References*

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