Virtual Worlds: Visualizing Early Modern Festivals in the Iberian World.

Virtual Heritage Visualization (VHV) broadly defines the use of communication technologies and their application to cultural heritage. VHV emerged in the 1990s and is now considered a useful tool for historical research. The theoretical framework and technical capabilities applied to VHV have greatly developed since then. Technologies to survey and visualize cultural heritage range from laser scanning to augmented reality.[1] The use of virtual heritage has been largely associated with museum display and education. An early example is the 3D visualization the museum exhibit at Dudley Castle in 1994. The aim of the project was to make this hypothetical re-creation of the castle in its original form accessible and interactive for visitors.[2] Museums, universities and other cultural institutions have likewise begun to explore uses of virtual heritage for research, preservation and cultural dissemination. Given its potential to deliver new experiences, VHV can also help to engage the public, and subsequently generate income.[3] Since the 1990s digital reconstructions and recreations of historic urban environments have proliferated. Indeed, fifteen years after the first virtual tour opened at Dudley Castle, the London Charter for the Computer-based Visualization of Cultural Heritage was issued. This charter— inspired by Heritage Conservation theory—aims to establish internationally recognized principles for the use of computer-based visualization by researchers, educators and cultural heritage organizations.[4] Another aim of the London Charter is to foster rigorous research and authenticity in VHV. Striving for authenticity distinguishes, for instance, the standards of the video game and the film industries from the use that researchers and educators make or should make of VHV. Creative industries tend to 'complete' historic urban environments through imagination and creativity and thus 'invent' how spaces may have been. In contrast, academic

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[1] I refer here to the UNESCO definition of cultural heritage. For an explanatory piece on how LIDAR or laser scanning works see: http://www.digitalsurveys.co.uk/how-3d-laser-scanning-works. For a definition and explanation of the differences between augmented reality and virtual reality see this blog entry http://www.augment.com/blog/virtual-reality-vs-augmented-reality/

[2] See the website of the project here (accessed September 2016 http://www.exrenda.net/dudley).

[3] An increasing number of museums are using augmented reality and similar virtual worlds to engage and attract the public. In a similar vein, the rise of the gaming industry, its potential role in education and its relationship with cultural heritage is under close scrutiny. See for example, E.F. Anderson, L. McLoughlin, F. Liarokapis, C. Peters, P. Petridis, S. de Freitas, (2009), 'Serious Games in Cultural Heritage', in M. Ashley and F. Liarokapis, *The 10th International Symposium on Virtual Reality, Archaeology and Cultural Heritage VAST - State of the Art Reports* (Malta, 2009), pp. 29–48.

[4] The London Charter is inspired by UNESCO's recommendations and charters on cultural heritage (http://www.londoncharter.org), and in turn has served as a template for other documents such as the Principles of Seville (http://smartheritage.com/seville-principles/seville-charter-project), concerned especially with developing standards for virtual archaeology projects. In addition, some specialized postgraduate courses are being developed internationally.

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research strives to avoid 'creative completions of data' and instead to employ VHV as a complementary method for developing rigorous historical research, only displayed visually. Various visual techniques are used to distinguish known, proven data from what is tentative or hypothetical.

Since the process of visually re-creating a historic urban environment needs to be developed on the basis of evidence and an analysis of primary sources, to the same standard required of any work of history, several questions present themselves. How can we successfully "translate" textual evidence into two-dimensional and three-dimensional form? How can we safely make the representation of hypothetical data effective visually? Can drawing and 3D modelling improve our understanding of the past? This short essay discusses how drawing and 3D modelling can be used as a research tool.

I have applied drawing and 3D modeling to three projects thus far: (1) the re-creation of the ephemeral structures for the entry of Philip I of Portugal (II of Spain) into Lisbon (1581); (2) domestic architecture in 16th-century Madrid; and (3) the re-creation of the architecture of early modern Lisbon. The latter work forms part of a series of publications and an exhibition that will open in the Museu Nacional de Arte Antiga in Lisbon in November 2016;[5] in this project I was able to include 'real-life' textures in the architectural digital re-creation as there were appropriate sources. However, for this report I will focus on the first case study, in which I did not use realistic colours or textures, as I wished to portray only what was available from the sources at hand.

Re-creating an Early Modern Festival through drawing and 3D modelling

The Re-creating Early Modern Festivals project aimed to explore novel and experimental research methods to the study of festivals. The main outcomes of the project have been an international conference, an exhibition at the Matthew Gallery in 2010, and publications.[6] This project included the development of a 3D digital re-

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[5] For further insights on the digital project I have coordinated see my forthcoming essay: L. Fernández-González,The Digital Turn of the Rua Nova Painting: Re-creating the Architecture of Early Modern Lisbon', in A. Jordan Gschwend, K.P. Lowe, H. Leitão (eds.), *The Global City. Lisbon in the Renaissance* (Lisbon, 2016).

[6] In addition to article-length publications, a selection of papers given at the conference', and others commissioned elsewhere, can be found in: F. Checa Cremades, L. Fernández-González, *Festival Culture in the World of the Spanish Habsburgs* Routledge (formerly Ashgate), Aldershort:2015.

creation of the ephemeral structures and street network of the Habsburg triumphal
entry into Lisbon of 1581. This digital model has pioneering aspects: it is the first
metricized version of the Baixa (i.e. downtown) in 16th Lisbon and also the first time
early modern ephemeral structures have been digitally re-created. The main objective
was to study the ephemeral architecture described in the sources.[7] The residential
architecture and other buildings are merely profiled as a backdrop to the festival display
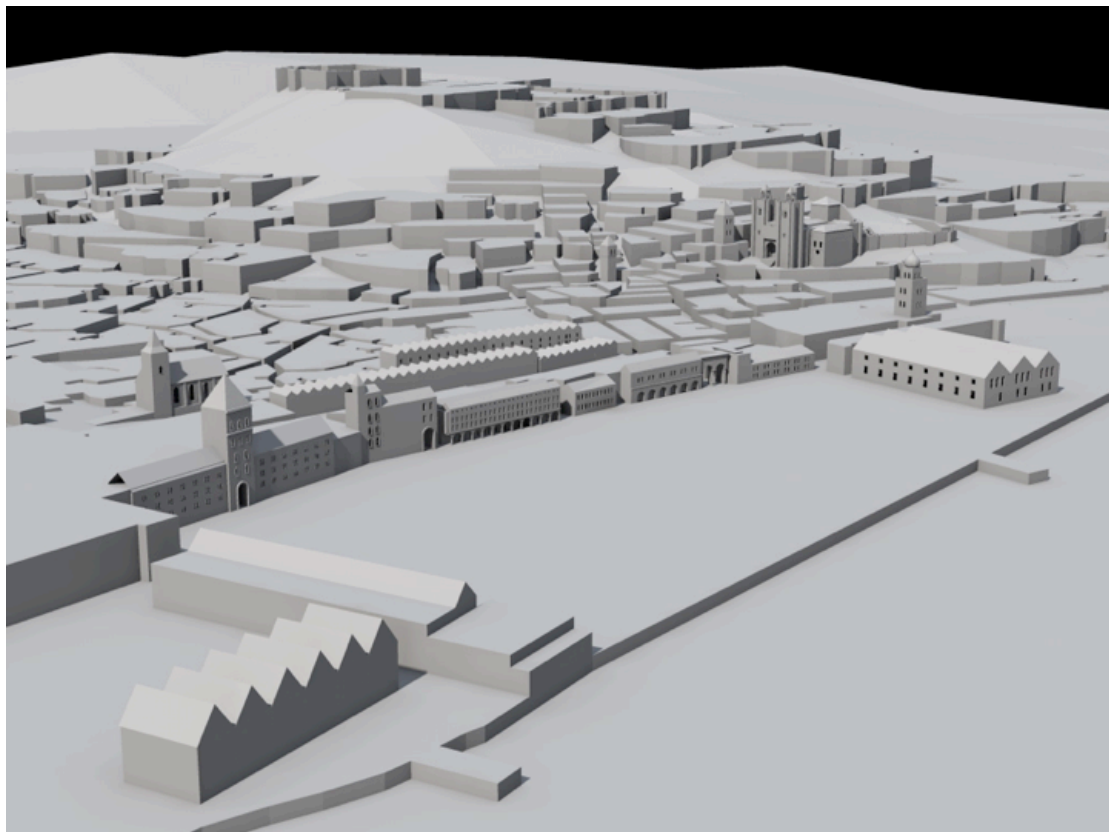in the 3D model. The 3D model was largely developed with open access software
SketchUp.[8]

**Figure 1. Urban study on the topography of early modern Lisbon before the natural disaster
of 1755. This still depicts the model at an early stage.[9]**

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[7] This project was made possible thanks to the generosity of the Spanish Consulate in Edinburgh, the
University of Edinburgh and the Society for Renaissance Studies (UK). In addition, research for this project
was made possible thanks to funding generously awarded by the University of Edinburgh and the
Calouste Gulbenkian foundation. The project website contains information on the project
(www.recreatingearlymodernfestivals.co.uk) and an on-line version of the exhibition can be found here:
www.recreatingearlymodernfestivals.co.uk/exhibition_laura.htm). Harry Kirkham and Nick Sharp were
assistants to the modelling and drawing for this project.
[8] The software has greatly developed since the project (see http://www.sketchup.com).The programme is
accessible to users at all levels and as such is attractive for teaching and self-learning. Some postgraduate
programmes in digital humanities favour the use of the game 2nd Life for their in-built interactive tools,
however, unlike 2nd Life, Sketch-up produces 2D drawings and 3D models to scale, with obvious benefits.
For other projects, such as the Rua Nova project, 3D max and other allied software was employed,
which is far more advanced. There are also other suitable suites, e.g. Rhino.
[9] This image featured in the exhibition in Edinburgh and can also be seen in one of the slideshows in the
on-line exhibition.

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Accounts of the entry of 1581 have no surviving accompanying graphic material and only two accounts cover the triumphal route of 1581 completely.[10] Guerreiro's account is the most complete, yet his descriptions of the architectural and artistic features of the ephemeral structures are difficult to interpret. Thus, in order to understand this festival fully it was necessary to develop its architectural form graphically. The accounts provided detailed information on the architectural measurements of the ephemeral structures. These measurements were especially detailed for the structures that stood on the Terreiro do Paço. Guerreiro wanted to reprint an illustrated chronicle, and although this seems never to have happened, he would have needed all the architectural data to create or commission the illustrations.[11]
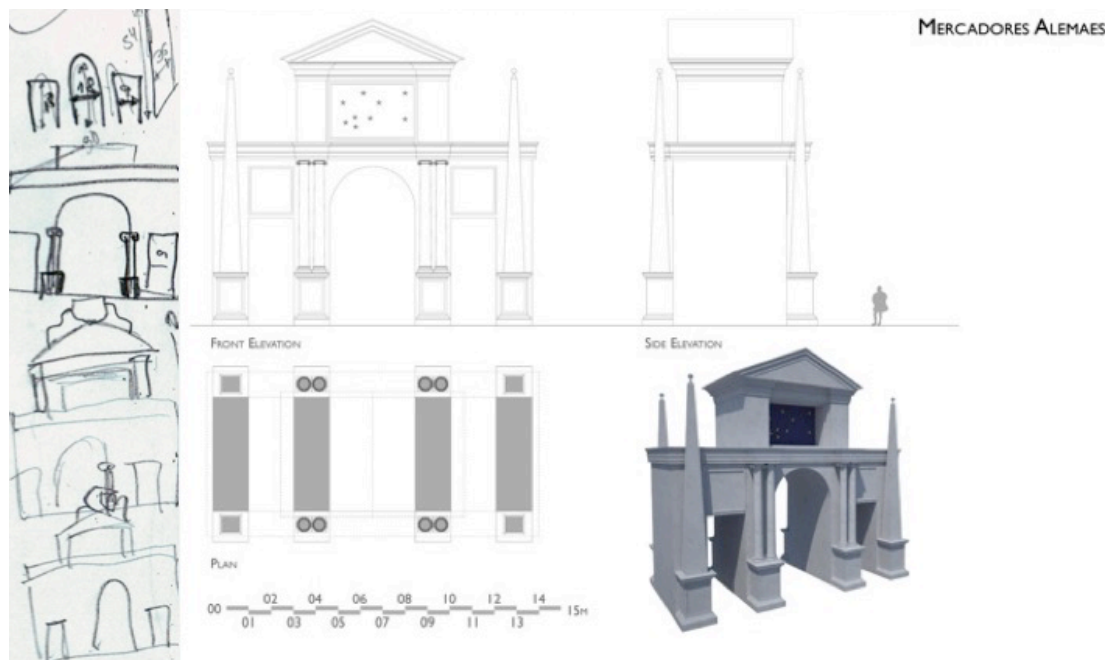

Figure 2. Annotations on a photocopy of the Guerreiro's accounts reflecting descriptions of the Arch of the German Merchants (Left) and Hypothetical 3D model and drawings of the structure of the Arch of the German Merchants, Lisbon, based on textual sources. © Laura Fernández-González, 2010[12]

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[10] There are many accounts and manuscripts, however, of particular relevance are A. Guerreiro, *Das Festas que se Fizeram na Cidade de Lisboa, na Entrada de el-rei D. Filipe, Primeiro de Portugal*, Lisbon, 1581 and I. Velázquez Salmantino, *La Entrada que en el Reino de Portugal hizo la S.C.R.M. de Don Philippe, Invistissimo Rey de las Españas, Segundo de este nombre, Primero de Portugal* [...], Madrid, 1583.
[11] Guerreiro, *Das Festas*, fol. 5. Please note I am using a copy from El Escorial Library which has a different pagination than copies kept elsewhere (e.g. the Warburg Institute and the Biblioteca Nacional de Portugal).
[12] Figure 1 included in L. Fernández-González, 'Philip II of Spain and Monarchia Universalis: Architecture, Urbanism and Imperial Display in Habsburg Iberia', PhD thesis, Vol. 2, p. 114.

Figure 2 shows my initial annotations to a copy of Guerreiro's account. The drawings took several stages to reach the final version, found on the right. Guerreiro describes the measurements of all architectural elements of the Arch of the German Merchants, including the height, width, and length, not only of the whole arch but also of each of its three passages. Measurements were also given for the pedestals, columns, recess, the panels with their decorations and the space between all these elements. These have been reproduced to the exact scale described; measurements given in Portuguese palms were metricized. This re-creation uses largely a neutral grey colour for the ephemera, which does not reflect the textual description. The inclusion of 'real-life' colours and textures would have been speculative (see recommendations on authenticity outlined in the London Charter). The text describing the arch is 25 pages long. The following excerpt exemplifies the data on measurements I was able to obtain:

> [...] no cabo de cais, que era la primeyra cousa em que el Rey auia de por los olhos. [...] Tinha este arco de grossura trinta & seys palmos, de largura sesenta & seys , & de altura cincoenta & quatro. Tinha tres portais, hum redondo no meyo de altura trinta palmos, & de largura dezoto. De cada una parte estaua outro portal quadrado, & cadahum tinha em alto dezoto palmos, & de vao noue.[13]

> [...] At the Cais pier, which was the first thing the King viewed [...] This arch was 36 palms deep, & 66 palms long, & 54 palms high. It had three gates, one arched in the middle 30 palm high & 18 palms long. Flanking this arch there were two lintelled gates, & each one 18 palms high & 9 palms long.

The accounts give measurements of other details which were reflected in the elevations and model. However, the drawings and 3D model are necessarily hypothetical re-creations based on the sources and many questions remain unsolved. Festival accounts both printed and manuscript have great potential for our understanding of the early modern Iberian world, but equally they pose some problems.[14] For example, there are printed festival accounts describing lavish ephemeral structures which has been proven never to have been built; others were destroyed by adverse climate conditions –before they could be used– as in the well-known case of the Habsburg entry of 1549 into Antwerp. In addition, accounts often include mistakes and Guerreiro for example highlights that there were things he would have liked to change had he been under less pressure of time.[15] There are also some inconsistencies in the description of the

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[13] Guerreiro, *Das Festas*, fol. 15.
[14] Teo Ruiz discussed some these problems in T. Ruiz, *A King Travels: Festive Traditions in Late Medieval and Early Modern Spain* (Princeton, 2012).
[15] Guerreiro, Das Festas, fol. 5.

ephemera across different accounts of the Lisbon event. (These inconsistencies do not apply to architectural measurements but they make us aware of the issues that such accounts pose.) On the drawings, only the lines of the arches have been profiled, yet these ephemeral structures would have been richly decorated. The sober aspect of these drawings is intentional, meant to give form only to known data, in contrast to arches erected for other festivals for which images have survived.
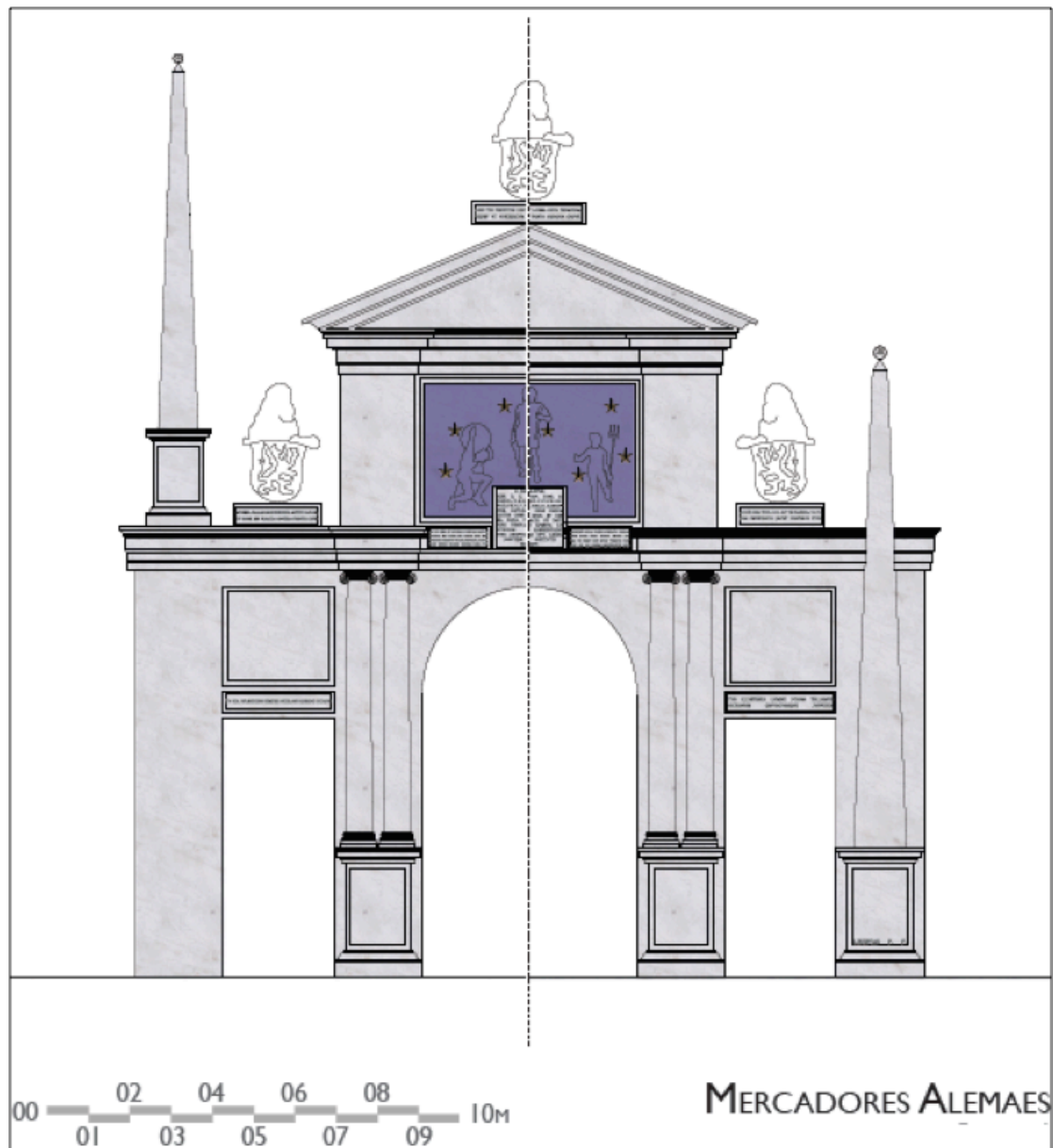

Figure 3. Hypothetical elevation of the Arch of the German Merchants, Lisbon, 1581. Alternative versions for the locations and scale of the obelisks.

The figures in profile on Figure 3 were included only to show location as there are significant omissions. The measurements and decorations of the pedestal of the obelisks are well known, however, the location the obelisks in the arch's structure is not clear in

the accounts. In addition, we only have partial information with regard to its measurements. As part of the documentation of the project in which every decision is recorded (this is defined as 'paradata' by the London Charter) two alternatives were drawn in order to contrast both options. The scale chosen for both versions of the obelisks replicates the measurements of obelisks that were widely used on the Terreiro do Paço for other structures also designed by royal architects. I have included this example for it is crucially important to display visually the historical data at hand. The prose in the accounts and other indications found in the sources tend to err for the version on the right of Fig. 3. On the other hand, the Arch of the German Merchants erected for Philip II of Portugal and III of Spain in 1619 had the obelisks (which the sources cite as 'pyramids') on the top of the first body of the arch. None of these indicators are definitive as the ephemeral decorations also presented significant differences. Students and academics over the years have offered their views in class, talks, workshops and public lectures. They were however aware that it is impossible, with the information at hand, to draw a definitive conclusion. Nevertheless, discussion on examples like this one are crucial for an understanding of what historical interpretation is and the challenges and potential it poses for both 'traditional' history writing and also for VHV applied to historical research.

What can we learn from drawing and 3D modelling?

This project cited here confirmed that the lower body of the Arch of the German Merchants (1581) was re-used or perhaps re-built to a similar scale for the arch the German community of merchants in Lisbon erected for Philip II of Portugal in 1619.[16] The recycling of ephemeral structures in festivals was common in this period and also a sign that the city had a more established festive tradition. In the case of Lisbon, recent research has reinforced this idea, demonstrating that previous assumptions with regard to the quality and quantity of the *fiestas* in the Habsburg world were inaccurate.[17] Research for the Lisbon festival of 1581 has shed light on the authorship and collaborations that had to be established between designers from the court and local masons for the erection of fifteen arches and other artifacts. With a 3D model of each arch located on the model of the city, one can map the location and hierarchies of any visual element or inscription and view them as the ruler and other members of the

[16] L. Fernández-González, 'Negotiating terms: King Philip I of Portugal and the Ceremonial Entry into Lisbon of 1581', in *Festival Culture*, pp. 87-113.
[17] See the Introduction for *Festival Culture.*

pageant would have done. In short, thanks to the use of digital research methods, I was able to take full advantage of sources that would have remained misunderstood without such a methodological approach. While the original arches did not look like the drawings and model, the ephemera's basic wooden structure would have had a similar form. In order to understand the decoration of these arches it is useful to observe surviving drawings and etchings of ephemeral structures. I can recommend exploring the opportunities that VHV provide for our understanding of the past, however, I would urge researchers and students to carefully consider issues of authenticity and the reliability of their sources. Drawing and modelling from even partially surviving structures tends to be less problematic than re-creating from textual data. I have, however, been able to identify original architectural drawings in archival collections for two other projects thanks to the sketches I drafted based on textual descriptions that will appear in forthcoming publications. While drawing a model will not always provide the researcher with an image for either personal use or publication, it will progress understanding of urban environments and architecture and allow users to assess their sources. In addition, as seen earlier, drawing and modeling can corroborate or invalidate historical accounts and progress scholarship; help identify designers, workshops, and ceremonial communities.

Broader Applications

With the rise in the use of VHV across museums, universities and cultural institutions, this is a significant time for research and teaching. I find it important to explore sources from every possible angle, hence I am investigating other digital methods for early modern festival research. I am working with my colleagues Ângela Barreto Xabier, Lisa Voigt and Íris Kantor toward a project to apply OCR software and GIS spatial analysis to collections of Portuguese festival accounts in a number of major repositories including the National Libraries of Portugal and Brazil.[18] This project will allow us to undertake comparative analysis across many textual sources and visualize/analyze this data in ways that were not possible before. The resulting resource will be useful tool for research and teaching.

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[18] The team extends beyond the four investigators, to include Pedro Cardim as a co-investigator and Fernando Bouza, Teo Ruiz and Jack Owens in the Steering Committee, among many other researchers.

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In sum, engaging intellectually with digital methods for research, teaching and wider dissemination is a reality that many of us encounter already or will encounter in our workplace. Our students may need to learn these skills in the future, as digital literacy is becoming increasingly important. While I have been able to develop a project using 3D modelling, this may not be feasible for every ceremony due to the lack of data. However, drawing has another function, as it helps us to think spatially. I have used some of these materials in classes covering different fields from postgraduate teaching on architectural conservation to a history seminar on research methods and how to use primary sources. Students enjoy the material as discussion in class leads to the potential materialization of the objects with 3D printers and also students' interaction with the 3D model in the screen (even better if they are large touchscreens). With these materials I have made my students draw the arches based on the descriptions and through the process they have been able to learn about the limits of sources and core issues of historical interpretation.