REF2021

Institution: University of Exeter	
Unit of Assessment: UoA 26 Modern Languages and Linguistics	

Title of case study:
Revealing Hidden Cities: using augmented reality and geo-locative media to enhance heritage presentation, tourism experiences and historic site management.

Period when the underpinning research was undertaken: 2013 to 2020

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Fabrizio Nevola	Professor of Art History and Visual Culture	September 2013 - present

Period when the claimed impact occurred: 1 August 2013 to 31 December 2020.

Is this case study continued from a case study submitted in 2014? No

1. Summary of the impact

The City Centre of Florence has been a recognized UNESCO World Heritage Site since 1982, yet the negative impacts of concentrated mass tourism are among the biggest threats to the historic centre. Working with Florence City Authorities and UNESCO Florence, Professor Fabrizio Nevola's extensive research into the urban, cultural and architectural history of Early Modern Italy has led to the release of a new digital product with Calvium Ltd, creative industry SME - the *HiddenFlorence* App. The award-winning augmented reality app, which has been downloaded 12,000 times from 40 countries was featured in the Channel 4 programme 'Travel Man' with 1.7 million viewers. Moreover, it enhances the **quality of experience for tourists, contributes to urban heritage management planning and strategy** by leading tourists to less well-known parts of the city, and has **shaped the branding strategies** of cosmetic company, Lush's marketing of new perfumes and the launch of its first stand-alone Perfume Library store in Florence in 2019.

2. Underpinning research

Hidden Florence is a collaboration with Calvium Ltd – an industry leader in GPS and AR content development – to create a unique guide to Renaissance Florence. The app's content is underpinned by long-term academic research in the Early Modern social and architectural history of Italian cities, resulting in a spatial and storytelling experience that is authentic and authoritative. The underpinning research is published in various articles and monograph, *Street life in Renaissance Italy* (Yale UP, 2020) (**3.1-3.5**). The research reveals:

- How urban space and the material culture of public space was experienced in the early modern period.
- That a focus on the everyday rather than on more obvious monuments and attractions can redefine long-held assumptions about the Renaissance city.
- That contemporary models of social media practices and public space can transform our understanding of urban space in the past.

The public-facing work of *HiddenFlorence* (**3.6**) has in turn contributed to the further development of these research themes, through additional funded research work. Recent awards - HERA project 'Public Renaissance' and the Getty Foundation 'Immersive Renaissance' - include app development and digital reproduction (3D/AR) as a core component of the research process. This second phase of work has expanded the original app through major institutional collaborations and partnerships, and deploys the format to new cities and new cultural assets around the world, including those housed within the National Gallery (London). *Hidden Florence 3D: San Pier Maggiore* was launched in November 2019 (AppStore) as an AR experience in the National Gallery, and has been taken up during the Covid19 pandemic as a way of promoting the gallery and research related to collections.

Nevola is a recognised authority on the architectural and urban history of Italian cities, and has published widely on the use and identity of spaces within cities, as well as the relations between commercial and residential spaces in Early Modern Italy. His current work looks at the street as a social space, the urban iconography that binds main streets into a coherent whole and the

relations between public and private self-representation, with an approach that also links the themes and issues of concern in the present to those of the past. Such an approach informs the design of the *HiddenFlorence* app.

Nevola has been principal investigator on a number of AHRC projects: 'Taverns, locals and street corners' considered the public use of taverns in the city, from Renaissance Italy to the present day. Prior to this, he conducted a research review of cities and urban communities in Early Modern Italy, and led the 'Street Life network', in which academics worked with non-HEI partners. In more recent projects, Nevola has explored the use of mobile phone apps for different aspects of narrative and history, including 'Writer on the Train' (a collaboration with author James Attlee and award-winning app-developers Agant) and the *HiddenFlorence* app. Nevola was co-director of 'Understanding Space in Renaissance Italy', funded by the Getty Foundation 'Connecting Art Histories' programme and run by Harvard University Villa I Tatti, Centre for the Study of the Italian Renaissance, Florence (2014-5). Since 2018, he has been a co-investigator on the VISTA AR European research project, based at the University of Exeter Business School, to develop, implement and evaluate a range of augmented reality and virtual reality experiences for a number of heritage sites in England and France. Most recently, since 2019, he leads a Getty Foundation funded project on digital art history approaches to mapping and modelling Renaissance Florence and a HERA-funded project on public space in Renaissance cities. All this work expands and develops his interest in early modern streets and street life, which underpins this impact case study.

3. References to the research

3.1 *Street life in Renaissance Italy,* Yale University Press 2020 *Submitted to REF2021*

3.2 (with David Rosenthal), 'Locating experience in the Renaissance city using mobile app technologies: the 'Hidden Florence' project,' *Mapping Space, Sense, and Movement in Florence: Historical GIS and the Early Modern City*, ed. Nicholas Terpstra, London: Routledge 2016, 187-209 *Submitted to REF2021* DOI: 10.4324/9781315639314

3.3 'Microstoria 2.0: Geo-locating Renaissance spatial and architectural history,' in *Early Modern Studies after the Digital Turn*. ed. Laura Estill, Diane Jakacki, and Michael Ullyot, Toronto: Iter, 2016 (Series: New Technologies in Medieval and Renaissance Studies), 259-82 *Submitted to REF2021*

3.4 'Surveillance and the street in Renaissance Italy', in 'Experiences of the Street in Early Modern Italy', Special Issue edited with G. Clarke, *I Tatti Studies in the Italian Renaissance*, 16 (2013), 1/2, 85-106 DOI: 10.1086/673404

3.5 'Review Essay: Street Life in Early Modern Europe', article commissioned by journal editor, *Renaissance Quarterly,* Winter 2013 (66.4), 1332-1345 *Available on request.*

3.6 Smartphone app: *Hidden Florence* published on AppStore and Google Play (July 2014).

Related website www.hiddenflorence.org contains authored articles published online and other related content published with a Creative Commons licence. Nevola wrote all the scripts (with David Rosenthal) as well as interview material for inclusion in the *Hidden Florence* mobile phone app. Project delivered in partnership with Calvium Ltd and the Comune di Firenze. A fully revised new version of the smartphone app *Hidden Florence* published on AppStore and Google Play (July 2019), resulting from a collaboration led with the University of Cambridge and University of Toronto. This now includes 5 full stories and accompanying online articles (c. 40 articles, total wordcount c. 25,000 words). The app was awarded "best app" prize by CHNT24 Congress on Cultural Heritage and New Technologies, Vienna, 4-6 November 2019. A related app called *Hidden Florence 3D: San Pier Maggiore* was launched in November 2019 (AppStore, iOS only).

4. Details of the impact

The *HiddenFlorence* App, published as a free app for Apple and Android, is an immersive experience blending academic research, digital media technology, and place-based heritage tourism. The app was developed in collaboration with Calvium Ltd, and in partnership with Florence city authorities, Florence UNESCO office, and Polo Museale della Toscana and the Mus.E civic museums. As an innovation in digital place-making, *HiddenFlorence*'s impact has been on enhancing methods for the presentation of heritage and cultural sites, improving the quality of tourism-led learning experiences through digital technology, and contributing to urban heritage planning and strategy.

Improving Tourism-led Learning Experiences

Since its first release in 2014, *HiddenFlorence* has now been downloaded around 12,000 times in over 40 countries. During the period covered by a 2017-8 report it was used in over 7,000 unique sessions, in Florence (2,177) and globally (5,001); 81% of downloads originate from the UK, Australia, New Zealand, USA and Canada, whilst 45% of active user sessions originate in Australia, USA and Canada, with 38% in the UK **[5.1].** Since its update in July 2019, the revised app has been downloaded a further 4500 times, and the length of each engagement has increased substantially. The re-launched app has been supported by a social media campaign, via Twitter, Instagram and Airbnb. Project partner networks have helped maximise visibility of the app through Polo Museale della Toscana, Comune di Firenze – UNESCO office, Mus.E, Museo degli Innocenti, and the National Gallery, London. As an example of user engagement a month-long campaign with the National Gallery in August 2020 resulted in over 120,000 impressions and 15,000 views **[5.2].** In November 2020, it won the UK App Awards' "Best Use of VR/AR in an app" award.

In-app feedback indicates user satisfaction at 80% positive. On GooglePlay, the app scores 4.9/5 overall; on Apple iStore, it has a five-star rating. Comments **[5.1]** include: "[The app] adds fantastic layers of depth to the city. You feel like a detective following faded clues that only you can see" (Phil); "Walking around Firenze with Giovanni gives you a feeling for what it must have been like to live here centuries ago" (Robert). The app also featured in the 2016 Christmas Special of the popular Channel 4 *Travel Man* series with Richard Ayoade and Hollywood actress Rebel Wilson, broadcasting to an estimated audience of 1.7million **[5.3].** Certifying the app's innovative blend of heritage presentation and augmented reality technology, Wilson comments: "It's kinda like playing PokemonGo but with historical sites" **[5.3]**

Enhancing marketing strategies for commercial entities

An indication of the influence of the HiddenFlorence can also be suggested through its impact on the British cosmetics company Lush. Linked to Lush opening its first stand-alone Perfume Library concept store in Florence in November 2019, developers based their own 'perfumed guide to a city' on *HiddenFlorence*: "the reinterpretation of the cityscape to deliberately include the sense of smell as part of Lush's launch of a new concept store and fragrance collection is probably not one of the predicted outcomes of your work on the app but I feel it is a very valuable one." The guide was an app to work as a treasure hunt with Florentine locations linked to their five newly launched perfumes. Lush repeated this concept for Soho in November 2019 when they launched their perfume collection in London and is now an integrated component of their own app, Lush Labs**[5.4].**

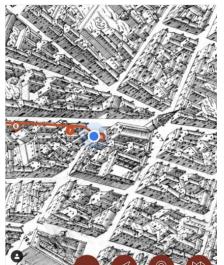### *Contributing to Urban Heritage Site Management Strategy*

The locative media research that drives *HiddenFlorence* has provided transformative cultural impacts in the relationship between visitors and their cities for regional tourist authorities. The

Florence UNESCO directorate approached Nevola to work on a new iteration of the app in recognition of its relevance to their "fundamental objective" to focus attention on the "decentralisation of tourism, extending the network of cross-city itineraries to include sites with potential for ulterior development" (The Management Plan of the Historic Centre of Florence, 19.1.16, pp 76, 81 **[5.5])**. In 2019 the app was noted as an exemplar of the application of the Management Plan, highlighting its usefulness in moving footfall from overcrowded sites to less well-known areas: "the effectiveness of these tools in redirecting the movement of the intelligent tourist, through informed storytelling and a playful approach to navigation of the city" **[5.5]**. For Dott. Carlo Francini (Director of Historic Centre of Florence), *HiddenFlorence* "has opened up completely new ways for us ... We are now looking at other ways in which we can use mobile digital technologies to open the city up to visitors and significantly extend the area … they visit in the city" [**5.6**]. Meanwhile, Nevola is working with five new cities to establish a 'Hidden Cities' platform, and has also been approached by Venice, Bologna and Mantua.

Impacting on Presentation of Heritage and Culture
HiddenFlorence's pioneering use of geo-locative digital media and augmented reality provides a valuable tool for urban storytelling, enhancing the presence of tangible and intangible heritage, and creating cultural value [**5.7**].

The digital reproduction of a 1584 map combined with Google Maps capabilities enables users to explore medieval Florence. Developers Calvium Ltd state: "the juxtaposition of an ancient map with its interactive digital form creates a powerful connection between the past and the present... we envision a long and collaborative journey across multiple cities, spanning a host of universities. Hidden Cities is about academic research and development in combination with public engagement and education." **[5.8].** *HiddenFlorence*'s six trails offer the cultural heritage of the wider cityscape as a curated experience, introducing micro-histories alongside culture, language and place-based storytelling. Dott. Carlo Francini described this as "a wider perspective of history, heritage and culture of the city to be told to both local residents and to visiting tourists. It makes a curated museum experience of the entire city, and encourages participants to know about this social and cultural 'alternative' history of the city. It has changed … the digital ways that we can present these urban histories on a world stage" [**5.6**].

For Nicholas Terpstra, renowned expert on digital historical mapping techniques, "current trends in historical mapping are to … map what at first may seem unmappable – smells, sounds, emotions– and to make … the connections between the early-modern experience of life in the city and the spatial and sensory profiles of that city. A particularly vivid example is the *Hidden Florence* app ... Geo-location in the app allows users to transport themselves into the streets as they were walked and experienced by ordinary Florentines in the 15th century. Users are thus introduced to the power of neighbourhood and local ties in early modern Florence and can understand how such a small city, physically, could contain so much variety of experience and people. *Hidden Florence* shows us the neighbourhood rivalries and hierarchies that underlay the spatial organization of the city." [**5.9**]

Recent new developments have extended the activity of the app's reach and engagement. *HiddenFlorence3D* (see above)**],** news coverage in the UK and Italy and transformative impacts on local residents' understanding of their neighbourhood (as documented in a short film, also shared on social media, 'A neighbourhood story'. As one resident noted "Thank you for doing this. Digitisation will be very important for us and especially for our grandchildren and those who will come after. Because, if there was no such research, the memory really fades very quickly". [**5.10**]. Meanwhile, a newly funded project is leading to the extension of the format and the creation of *HiddenCities* for 5 new cities in which close collaboration with local museums and their collections is part of the app design. In 2019 *HiddenFlorence* was awarded the 'App prize'

at the Conference on Cultural Heritage and New Technologies, Vienna, a heritage-practitioner focused conference. [**5.10**].

5. Sources to corroborate the impact

5.1 App Analytics Report 2017/2018; App Feedback and Reviews. Available through Apple and Android devices on AppStore and GooglePlay. Captured in a report compiled by Innovation, Impact and Business, University of Exeter, January – March 2018. 2020 UK App Awards: https://youtu.be/8tR0SXTKGqk.

5.2 Social media campaign report compiled by the National Gallery for the August 2020 HiddenFlorence campaign related to the San Pier Maggiore HiddenFlorence3D work.

5.3 Viewing Data, 25th December 2016 Ch4. Available at: https://www.barb.co.uk/viewing-data/weekly-top-30/. [Accessed 11/04/2019]; Travel Man: 48 Hours in Florence. Channel 4 On-Demand. Available at: https://www.channel4.com/programmes/travel-man-48-hours-in/on-demand/65403-005 [Accessed 11/04/2019].

5.4 Testimonials from Lush

5.5 The Management Plan of the Historic Centre of Florence can be consulted http://www.firenzepatrimoniomondiale.it/en/piano-di-gestione/. 2019 update on Hidden Florence is available at: http://www.firenzepatrimoniomondiale.it/en/hidden-florence-esplora-la-citta-al-tempo-di-cosimo-i-de-medici/

5.6 Informal testimonial, Dott. Carlo Francini, Director of Historic Centre of Florence, UNESCO World Heritage site Office, Comune di Firenze)

5.7 Journal article: Rodgers, P.A., Mazzarella, F. & Conerney, L. (2020). Interrogating the Value of Design Research for Change. *The Design Journal.* 1756-3062. DOI: 10.1080/14606925.2020.1758473

5.8 Calvium Ltd. published accounts of their work with Nevola: https://calvium.com/projects/hidden-florence-3d/ https://calvium.com/projects/hidden-cities/ and https://calvium.com/projects/hidden-florence/

5.9 Expert Opinion, Nicholas Terpstra, Published Interview: *The Latest on Digital Humanities: An interview with Colin Rose and Nicholas Terpstra*. Available at: https://www.routledge.com/history/posts/9757?utm_source=adestra&utm_medium=email&utm_campaign=SBU3_sac_4mx_1em_5his_cnf16_stan16_90139_RSA [Accessed 10/04/2019]

5.10 News coverage for the project activity collated with links at: www.hiddenflorence.org/news/; direct link for "A Neighbourhood Story" https://hiddenflorence.org/hf-3d/a-neighbourhood-story/ . 7'29" – 7'45" for the quote.