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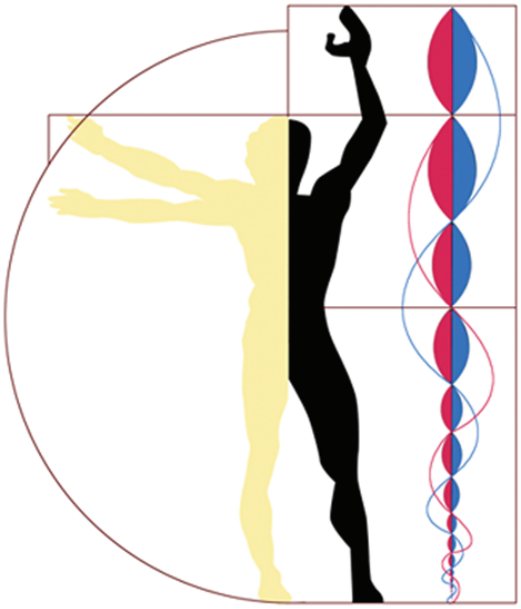
XIII Forum Internazionale di Studi

Le Vie dei Mercanti

Carmine Gambardella



HERITAGE and TECHNOLOGY

Mind Knowledge Experience

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XIII Forum Internazionale di Studi

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Il Progetto "Ecoturismo urbano per la fruizione sostenibile dei Beni Culturali in Campania", in attuazione degli Obiettivi Operativi 2.1 e 2.2 del Programma Operativo FESR Campania 2007/2013 per la realizzazione e/o il potenziamento, nel territorio della regione, di forti concentrazioni di competenze scientifico tecnologiche, di alto potenziale innovativo, intende favorire la concentrazione di competenze scientifico-tecnologiche finalizzata a rafforzare la competitività dei sistemi locali e delle filiere produttive regionali non solo nei settori dei servizi associati al turismo e beni culturali ma anche in settori ad altissima tecnologia che possano rappresentare una svolta tecnologica e culturale all'approccio innovativo per lo Sviluppo sostenibile in aree ad altissima vocazione turistica.

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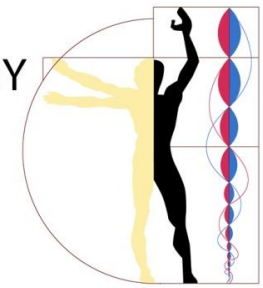

Pressure of Tourism on Heritage and Technologies for an inclusive Society

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Abstract
The heritage enhancement contains in itself a contradiction that seems irreconcilable: on one side they have to broaden its accessibility, on the other they have to limit damages caused by tourism.
An elitist tourism cannot constitute the solution, but alternative types of fruition could in part come in aid, thanks to ICT and georeference.
Nowadays, technologies not only are directed to replace the real experience, or to enhance it, but even to simulate it by entering parameters of physical reality. Therefore, in this field they are developing “virtual tourism” projects, that will lead to a wide accessibility of cultural heritage, in view of a true "inclusive society" able to reach even the weaker segments of the population – in the same time, the indiscriminate use of heritage could be reduced.
The natural evolution of these projects may even involve the landscape, urban and architectural design (e.g. the transport planning, or innovative infrastructures). This kind of approach, that requires and combines humanities and technical skills, aims to make available and accessible not only the historical, architectural and artistic heritage in itself, but also intended as system.

Keywords: virtual tourism, accessibility

1. First and second generation of virtual tourism
The heritage enhancement contains in itself a contradiction that seems irreconcilable: on one side they have to broaden its accessibility, on the other they have to limit damages caused by tourism.
In its turn, tourism is often elitist while Cultural Heritage belongs to all.
Therefore, in this field they are developing “virtual tourism” projects, that will lead to a wide accessibility of cultural heritage, in view of a true "inclusive society" able to reach even the weaker segments of the population – in the same time, the indiscriminate use of heritage could be reduced.
The so-called virtual tourism is the umpteenth expression which is opposed to something real. Even in this particular application context we can already mention first, second and third generation of virtual tourism
The first one is nothing but a special version of e-commerce, and no doubt has changed a lot (if not revolutionized) the way you plan and organize trips: the user can customize a holiday package including transport, accommodations meals, visits to museums, tickets for shows and participation in trade fairs. And all this by choosing price ranges, comparing services and offers, and customizing them accordingly.
Virtual tourism second generation has made his own the potential of geo-referencing: the user can not only view the services offered in its range (and possibly book them), but also - with the help of special app - receive news, be guided in thematic tours of his choice, and so on. So not only more services “upstream of” the trip, aimed at its organization, but also services "during" the journey, to accompany the visit and support it from the point of view of content.
Almost obvious consequence has been the evolution given by “augmented reality”, with specific apps connected to QRcodes, where the information apparatus comments and complements the visible reality. That’s a true, communicative mediation in real time.

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2. Third generation of virtual tourism

Another development, with different features, stands in between second and third generation of virtual tourism: that's inevitable advent, also in this field, of social media.

The tourists and visitors community grows and exchanges views directly, further reducing the role of intermediaries. The availability of a huge photographic documentation (see the case of Flickr, website owned by Yahoo group, and other similar) and many comments and opinions (from TripAdvisor to several blogs that you can hit on in your personal search) has enabled a greater awareness and self-determination of the trip experience.

There have been some cases where these communities close the loop, so to say: achieving real contacts between people. See, among others, the "Angels for travelers" initiative, a large-scale project: it collects people available as local guides – or for simple suggestions on the places in which they live. They're also available to real encounters once the tourist has physically reached the place [5].

As regards the third generation of virtual tourism, it doesn't consist only in the preparation and organization of the real experience; no more *support* in real time of real experience, but - as the term "virtual" itself suggests - *replacement* of real experience.

At this point, therefore, a new route is opened, although already foreshadowed by many products, but this is not a déja vu. What does exist for some time, in this field, is indeed the construction of a virtual world (not existing in the real world, or existing in the past but now disappeared - typical application in the archaeology field): here, through keyboard before, and later through more and more natural interfaces, the user can move around by performing a real visit.

In these cases, the tourist is almost always played by a sort of avatar: see the testbed performed for the Virtual Museum of the Ancient Via Flaminia (multiuser virtual reality application, installed in 2010 in the National Roman Museum at Diocletian Baths, with the coordination of the CNR [6]. Other times, the visitor can move around in person in virtual environments: among the first applications, see the famous case of the Queen Nefertari tomb, on the occasion of exhibition "Nefertari: Light of Egypt" carried out in Rome at Palazzo Ruspoli in 1994. The virtual reconstruction of the monument, by now inaccessible, was carried out with a system developed by ENEL and Infobyte, with the CNR contribution, in a room with projections to be observed with stereoscopic glasses. The visitor was able to literally move around the environment, where depicted figures came alive, going beyond the opportunities of a traditional visit.

Still other systems exploit *kinect* and similar instruments to transmit in the virtual world the physical movements of the visitor, thereby adapting the visuals that come his way. For obvious reasons, it is necessary to establish a sort of "movements abacus" that correspond to different situations (advancing, turning, stopping etc.). This is an experience limitation, in terms of immediacy: one of the first cases was the experimentation carried out within the European project V_Must (coordinated by Sofia Pescarin, CNR, 2013) at the Vatican Museums, which proposed the interior of an Etruscan tomb as it appeared originally (with items that you could actually observe in the museum showcases).

But the challenge of the "virtual tourism" third generation is still different: it must get to allow the visitor to (virtually) move in the *real place* and in *real time*. No need to rebuild worlds, real or imagined.

Why this goal? Today more than ever, only a few sections of society can afford to travel. Not only for income reasons, but also because they haven't the time, or they haven't the health. Not to mention the security issues related to places where, for example, war actions are in operation and where in fact it is not recommended to travel.

Moreover, it is simply impossible in just one life to visit all the places that our planet offers. If, however, it was possible to do it from your own home, a few trips would be made available at least in virtual mode.

A first, remarkable experiment in which real journey and virtual journey seem to coincide is the "virtual journey on the Trans-Siberian Railway" (Moscow-Vladivostok: virtual journey on Google Maps) [7], originated by a collaboration between Google Maps and the Russian State Railways. A simple camera records the landscape from the window of a train compartment for all the more than 9,000 kilometers of the trip. The virtual tourist can also hear sounds and noises typical of the journey - the noise of the rails, the radio that is proposed in the wagon. He can also "go down" at the stops he prefers, where elements of natural or cultural interest are pointed out.

However, natural limits of the project (in itself, extremely interesting) place it halfway between traditional documentary and "virtual tourism" last generation.

The challenge - we said - is more complex because it aims to give back as much as possible the subjectivity of the travel experience, with the opportunity to look towards you like (while the Trans-Siberian Railway camera is unmovable) and to move "there and now" while remaining physically "here". The point is, therefore, to introduce a real avatar, i.e. not a virtual character but a "device" that is physically in place, able to move around for us according to our commands.

On this track, interesting experiments have already been carried out. Very recently (August 2014) has been presented the project After Dark by the research team of Ross Cairns, David Duke and Di Tommaso Lanza,

in collaboration with the Museum Tate Britain in London: it proposes the use of robots on the ground (according preset trajectories but also with remote control) to visit the museum at night. In this case, the robot can simulate the visitor who walks in the rooms.
The most advanced lines of research are currently focused on the use of drones precisely on avatar's stead. Researchers David Mirk and Helmut Hlavacs (University of Vienna, Research Group Entertainment Computing) have recently written about Using Drones for Virtual Tourism, addressing in particular the interface issue. You can view their experiment on line [8].
While recognizing the great interest for outdoor visits, whose fundamental problem seems to remain the security and the stringent regulations recently adopted, our research group is currently exploring the opportunities for indoor visits.
While the exterior is, almost always, visible without limitation, the access to interior spaces of monumental, architectural and artistic heritage is instead subject to greater constraints: because of lack of staff, or lack of security conditions, or visiting hours, and others. A virtual tour is therefore justified even more.
From the technical point of view, the challenge is very interesting: the matter is to re-create in a closed and confined environment a microgeodetic reference system, to allow remote control by virtual visitor: all the more important when you consider the protection of the cultural heritage itself.
The availability of an intuitive interface, as natural as possible, in addition to the enrichment with a didactic augmented reality - will allow everyone a visit experience truly immersive, and certainly even more exciting thanks to the possibility to fly.
It should of course face a number of related issues. The drone must tend to the smallest possible footprint (although the first experiments contemplate large spaces, one can envisage a future in which the environments will be more limited, and in the same environment will have multiple drones simultaneously), and the video system plays a very important role: it must be sophisticated (360 degrees), allowing to appreciate details even at very large scale.
The recent appearance on the market of spherical cameras is of particular interest: thanks to the recording system, they allow the user to see again its visit, but simulating another angle of view and different angles of the head.
Of course, devices for UAV must meet the highest demands of lightness, without restricting the output quality and sharpness. It's clear that another key node is the flight autonomy, however an indoor tour even if very short can imply a very interesting experience.
Tourists can shoot photographs as in the physical reality, storing them directly on the memory of their your devices (not only laptop but also smartphone, tablet … or a couple of stereoscopic glasses, in the near future).

3. Related issues

Predictable critics concern both the impossibility of replacing the real experience in all respects, and the supposed "damage" for the tourism industry.
To the first we reply that the real experience is irreplaceable and it will do, at least for now. Nevertheless, we repeat that tourism is a privilege. Thus this virtual experience can be an important tool for a truly "inclusive society" from the social point of view: it can ensure the enlarged access to cultural heritage – an issue that insistently recurs in the Horizon 2020 program. Not only: sometimes, especially in indoor environments, there may be different types of barriers that effectively exclude whole sectors of visitors. Therefore this form of tourism, in some cases, will allow access to artistic and architectural heritage otherwise not available for certain people.
To the second we reply that - as in many similar cases could be verified - this new form of tourism far from cause difficulties to the real tourism industry, could instead support and enhance it. In general, in fact, the opportunity to preview places and landscapes can stimulate the interest to really visit them. Virtual tourism may in fact be a formidable promotional tool, also acting as a "pre-visit", the last stage of a journey organization more and more aware.
In conclusion, we believe that not only this new form of virtual tourism is now within the reach of our technical capabilities, but it also represents an effective response to certain social and cultural issues.

4. Needed researches

The natural evolution of these projects may even involve the landscape, urban and architectural design. As this kind of approach, that requires and combines humanities and technical skills, aims to make available and accessible not only the historical, architectural and artistic heritage in itself, but also intended as system – researches in this sense are needed. How could we provide infrastructures able to support this technology? How could we integrate the transport planning with it?

Virtual tourism has to be organized as *experience,* and necessary technology is *already available.* We don't need another amazing innovation, but we've to really exploit what already exists. Very often innovation runs faster than its exploitation, so we've lost many occasions. We assist to many interesting experimentation, but we very rarely see their full implementation.
As the real tourism is *holistic experience,* through territories that constitute actually complex systems, research has to study how to reproduce without excessively impoverish them. Also the *space perception* matter is an interesting field of research: what are the features of the *immersivity* effect?
And increase of data sharing (e.g. data related to systems as primarily Google Earth, Google Maps and Street View - now in common use) which scenarios opened and could open even more?

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