Demo: The Triangolazioni Mobile Guide for Exploring the Interconnections between Science, Art and Territory

(Article begins on next page)

01 August 2024

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ABSTRACT

Most Cultural Heritage sites are immersed in parallel and interlaced stories about art, history, and science, which are typically presented as isolated narratives, providing a partial view of the richness of such places. To address this issue, the Triangolazioni project of the University of Torino has developed a mobile app that enables the customer to gain an overall view of these stories, and their interconnections, by hopping from one to the other, depending on her/his information interests.

This demo paper presents the Triangolazioni mobile guide, which supports the thematic exploration of Points of Interest through the navigation, and the exploration of narratives based on their thematic similarity as well as on the Points of Interest they talk about.

CCS CONCEPTS

• **Human-centered computing** → **Interaction techniques**; • **Information systems** → **Geographic information systems**; **Web searching and information discovery**.

KEYWORDS

mobile guides, Cultural Heritage, location-based hypertext

1 INTRODUCTION

Location-based hypertext [1, 3] is a core model for the design of tour guides that present Cultural Heritage (CH) sites and items as hypertextual components to be browsed during the exploration of information. However, in most tourist guides, hypertext has been used either to connect the steps of a single narrative or to geo-locate the set of separate stories available in different places. For instance, CHIP [7] exploited semantic relations between CH items, and artists to interconnect them. However, only direct associations between entities were used to support the browsing of information. Moreover, Riot! [2] presented (separate) location-sensitive interactive plays to visitors in Bristol.

Most Cultural Heritage sites are immersed in parallel and interlaced stories about art, history, and science, which should be connected to each other to represent their richness. Therefore, in the Triangolazioni project (https://www.triangolazioni.unito.it/), we took a different perspective, i.e., that of linking entities, such as CH sites and items, and stories, through spatial, semantic, and topic relations with the aim of presenting an overall view of the network of existing relations and enable tourists to explore such different viewpoints on the places they visit.

(a) Introduction to the story and map displacement.
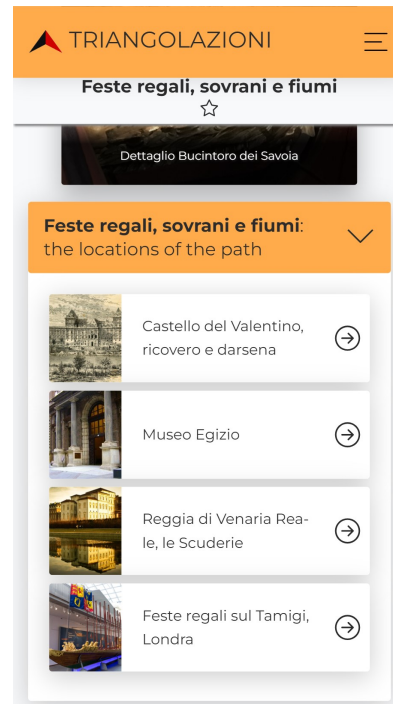
(b) Points of Interest of the story.

Figure 1: Visualization of the story selected by the user.

(a) Presentation of a Point of Interest of the current story.

(b) Paths (related narratives) available for side walking.

Figure 2: Details about a Point of Interest and its related stories.

We thus built the Triangolazioni mobile app, which uses the semantic relatedness among stories to support a flexible exploration of Cultural Heritage [4, 5]. The idea is that an appropriate medium should not merely provide a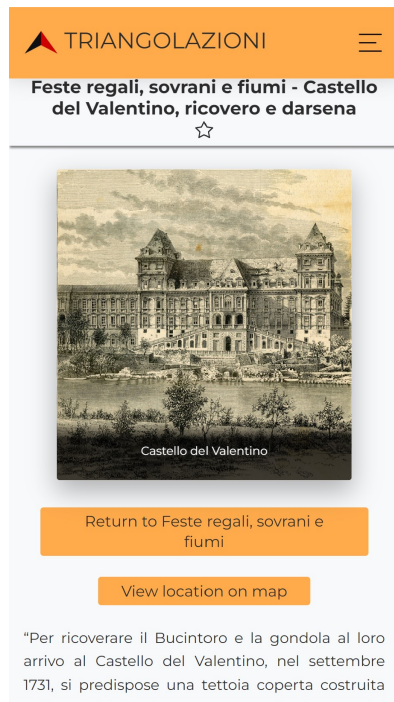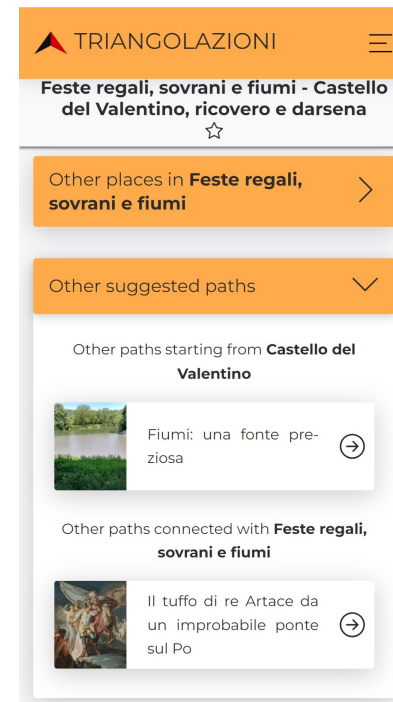 navigable list of contents related to a historical site, but rather motivate users to explore (virtually or physically, at their choice) a network linking sites, stories, and characters, whose unexpected connections become the real thought-provoking message. The rest of this paper presents the Triangolazioni app, which can be used from a mobile phone, tablet, or desktop device to explore the Cultural Heritage of Torino City, on which it is grounded. The key concept leading the organization of this app is that of supporting "side walking" between stories. That is, enabling the user to browse a specific narrative while being aware of other strictly related stories, e.g., because they talk about the same place (s)he is visiting, or they deal with the same topic, such as the concept of "measurement" from the historical point of view. By hopping from a narrative to a related one, and possibly going back through a structured visual breadcrumbs representation, the user can explore different dimensions of the Cultural Heritage of the town, in an interlaced way.

We have presented Triangolazioni for the first time at the UNIGHT event (United citizens for research, https://unightproject.eu/en/events/turin-night-2022) in September 2022, and we will exploit it at UNIGHT 2023 to support the exploration of Cultural Heritage in Torino City.

2 THE TRIANGOLAZIONI PROJECT

The Triangolazioni project has been funded by the Public Engagement Lab of the University of Torino. The Computer Science Department designed and developed the app, and several other Departments have populated it with stories concerning different aspects of the Cultural and Natural Heritage of Torino city and its surroundings. The stories are centered in Torino City but may involve different places related to the activities carried out by the personages they describe, or because they concern people living far away, such as Ancient Egyptians, or items located elsewhere, such as the Bucintoro ship that is stored in Reggia di Venaria, nearby Torino. The challenge of this project is that of linking such entities, both thematically and geographically, to provide a unified viewpoint on them.

3 THE TRIANGOLAZIONI APP

Triangolazioni is based on an OWL [6] ontology that associates (i) entities (places, objects, and people) within a narrative, and (ii) narratives within clusters dealing with specific topics [4]. The "narrative" concept aggregates entities and the "cluster of narratives" concept aggregates topically similar stories.

Figures 1a and 1b show the upper and lower portions of the page describing a specific narrative ("Feste regali, sovrani e fiumi" - royal feasts, kings and rivers), which the user can open by browsing the list of stories from the catalog of the app or by scanning a QR code located in one of its places.[1] The upper portion introduces the story,
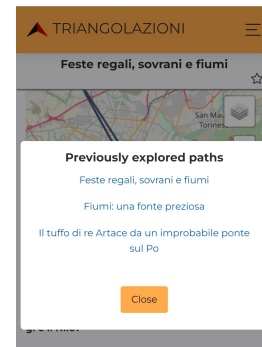
Figure 3: Visual breadcrumbs showing the stories that the user previously browsed.

the lower one enables the user to browse the details of the Points of Interest it talks about.

The user can click on a Point of Interest to view its details, like the "Castello del Valentino" in Figure 2a. Below the presentation of the place (Figure 2b), there are the links to browse the other sites of the narrative, or to *sidewalk* to other suggested paths, which might be relevant either because they concern the current place ("Other paths starting from Castello del Valentino") or because they are thematically connected ("Other paths connected with ..."). By selecting one of these stories, the user can start a side tour that can be closed to go back to the previously explored narratives by exploiting breadcrumbs. See Figure 3, where the user previously visited three different stories.

ACKNOWLEDGMENTS

REFERENCES

[1] Mark Bernstein. 1998. Patterns of Hypertext. In *Proceedings of the Ninth ACM Conference on Hypertext and Hypermedia: Links, Objects, Time and Space—Structure in Hypermedia Systems: Links, Objects, Time and Space—Structure in Hypermedia Systems* (Pittsburgh, Pennsylvania, USA) *(HYPERTEXT '98)*. Association for Computing Machinery, New York, NY, USA, 21–29. https://doi.org/10.1145/276627.276630

[2] Mark Blythe, Josephine Reid, Peter C. Wright, and Erik Geelhoed. 2006. Interdisciplinary criticism: Analysing the experience of Riot! a location-sensitive digital narrative. *Behaviour & Information Technology* 25, 2 (2006), 127–139. https://doi.org/10.1080/01449290500331131

[3] Charlie Hargood, Verity Hunt, Mark J. Weal, and David E. Millard. 2016. Patterns of Sculptural Hypertext in Location Based Narratives *(HT '16)*. Association for Computing Machinery, New York, NY, USA, 61–70. https://doi.org/10.1145/2914586.2914595

[4] Noemi Mauro, Angelo Geninatti Cossatin, Ester Cravero, Liliana Ardissono, Guido Magnano, and Marco Giardino. 2022. Exploring Semantically Interlaced Cultural Heritage Narratives. In *Proceedings of the 33rd ACM Conference on Hypertext and Social Media (HYPERTEXT'22)*. ACM, Barcelona, Spain, 192–197. https://doi.org/10.1145/3511095.3536366

[5] Noemi Mauro, Angelo Geninatti Cossatin, Ester Cravero, Liliana Ardissono, Guido Magnano, Marco Giardino, and Claudio Mattutino. 2022. A Mobile Guide to Explore Interconnections between Science, Art and Territory. In *Adjunct Proceedings of the 30th ACM Conference on User Modeling, Adaptation and Personalization (UMAP '22 Adjunct)*. ACM, Barcelona, Spain, 397–401. https://doi.org/10.1145/3511047.3537649

[6] OWL Services Coalition. 2004. OWL-S: Semantic Markup for Web Services. http://www.daml.org/services/owl-s/1.1B/owl-s/owl-s.html.

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[1] It can be noticed that the app is a multi-language system. However, we are currently translating the domain-dependent information into English. Therefore, now, the narrative-specific contents are expressed in the Italian language.

[7] Yiwen Wang, Natalia Stash, Lora Aroyo, Peter Gorgels, Lloyd Rutledge, and Guus Schreiber. 2008. Recommendations based on semantically enriched museum collections. *Journal of Web Semantics* 6, 4 (2008), 283–290. https://doi.org/10.1016/j.websem.2008.09.002