

Towards a novel ontology-driven interface for cinematographic places

Andrea Nasi^{1,*}, Diego Magro¹ and Vincenzo Lombardo^{1,†}

¹University of Torino, Italy, Computer Science dept.

Abstract

Archives and commercial platforms usually present films as bibliographic resources, with basic attributes such as director, actors, year of production, and language. The film's story is often limitedly represented through a synopsis or a short summary of the plot. Our project focuses on a relevant though neglected element of the story: the film places, intended as the narrative places, i.e. the places where the events of the narrative occur, and the displayed locations, i.e. the places that represent the narrative places in the film. The real-world counterparts of film places, once represented in film archives and commercial platforms, could have an impact on practical activities, such as location management, film tourism, the history of urbanism, and cultural archives. This paper presents a demo of a system for displaying places and their relationships within a larger cultural context. The system is currently in use in the RevIS (Revisualising Italian Silentscapes, 1896-1922) project, for the exploration of the relationships between the cinematic productions of Italian silent cinema of the early twentieth century and the places, to address their dynamic transformation during that period. Digital maps display a parallel view of film narrative places and displayed locations, while users can browse the film sequences and access the individual scenes. The dual-map metaphor allows for fleshing out the connection between the plot sequences and the places and relies upon an ontology-based metadata model we have devised for the digital archive of films and places. We also report on a preliminary evaluation of the demo interface, with promising results and expected criticisms.

Keywords

Semantic Web, Ontology, Interactive Interface, Digital Maps

1. Introduction

Places have strong connections with complex cultural contexts. They can be where historical or cultural events occur, and are embedded in particular landscapes that shape their identity and undergo transformations over time. In this paper, we focus on the relationship between places and movies. Places in movies have emerged as central objects of scholarly reflection within film studies and cultural heritage. Film places are active narrative agents that shape viewers' perception of some space, with its history and cultural habits[1]. Their representation across diverse movies under diverse conditions, such as the various directors' intentions or the epoch of the shooting, offers the possibility for the study of their evolution from a historical and cultural point of view[2]. Current film archives and commercial platforms, such as the British Council film archive[3] and the Internet Movie Database (IMDb)[4], usually limit their place information to shooting/displayed locations, without distinguishing between the place that is narrated (i.e. the narrative place) and the place that is shown to depict it (i.e., the displayed place). Indeed, they primarily focus on basic attributes such as titles, directors, and actors, according to archival standards such as the general Functional Requirement for Bibliographic Resources (FRBR)[5] and the movie-specific EN15907[6]. These two entity-attribute-relationship models describe cinematographic works and their different manifestations following the FIAF Cataloguing Rules for Film Archives[7] and FIAF Moving Image Cataloguing Manual[8] (i.e., an extension of the former to align with the Linked Open Data (LOD) paradigm [9]), both published by the International Federation of Film Archives (FIAF). Although granting the interoperability between film archives, such standardised descriptive

ISWC 2025 Companion Volume, November 2–6, 2025, Nara, Japan

*Corresponding author.

†These authors contributed equally.

✉ andrea.nasi@unito.it (A. Nasi); diego.magro@unito.it (D. Magro); vincenzo.lombardo@unito.it (V. Lombardo)

ORCID 0009-0005-7691-468X (A. Nasi); 0000-0001-9681-0080 (D. Magro); 0000-0002-8166-9827 (V. Lombardo)



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metadata schemata remain rooted in bibliographic representation, overlooking film spatial and narrative dimensions[10]. Beyond traditional cataloguing, the LOD paradigm has inspired initiatives such as Wikidata[11], a collaborative and structured knowledge base built upon the Resource Description Framework (RDF). Wikidata stores information as RDF triplets, providing film-related data including bibliographic properties (e.g., director (P57), genre (P136), distributed by (P750)) and limited spatial descriptors such as filming location (P915) and narrative locations (P840). However, these properties often point to generic places without characterising their narrative role. Recent initiatives have started to address this representational gap, especially as edutainment approaches. The web blog Atlas of Wonders[12] provides narrative journeys through shooting locations, following the narrative pacing of the described film. The Worldwide Guide to Movie Locations[13] focuses on shooting locations as tourism destinations. The ReelStreets platform[14] targets the temporal evolution of shooting (or displayed) locations by comparing film frames to recent pictures. However, while narrative places are underrepresented, as shooting locations attract the majority of scholarly and public interest, the devising of an effective representation in digital systems could have an impact not only on the study of cinematic places but also other collateral fields such as location management and movie-induced tourism [15]. In this paper, we present an ontological base for the formal representation of places and their roles in films and a visualisation interface that displays the place-film relationships, for scholarly research and application in wider contexts. Our methodology involves: (1) the creation of a shared (ontology-based) metadata schema, for a formal representation of places concerning narrative places and filming locations; (2) the systematic cataloguing of data within a database structured according to the devised ontology; (3) the design and a prototype implementation of a web application that enables users to explore movies through a novel approach, displaying places as the narrative unfolds. The following sections are organised as follows: Section 2 introduces the main concepts of the domain of interest, their semantic representation, and the system goals. Section 3 describes the system architecture, focusing on the needs and challenges that drove the design process. Section 4 fully describes the demo, and Section 5 concludes the paper with some consideration on a preliminary yet encouraging evaluation of the system.

2. Film and Places

Since 1980, UNESCO has officially recognised films (or moving images) as cultural heritage assets[16]. Whether rooted in reality or entirely fictional, their relationships with the places they depict are a living memory of artistic creativity, cultural values, and social ideologies of their time. To fully explore these aspects within a digital system, we have devised an ontology-based metadata model that focuses on how places are represented (or used to represent) in different films and how they can change over time. To do so, we described films as bibliographic resources, following existing archival standards such as EN 15907, to ensure interoperability. In particular, films are intellectual works, with basic attributes such as title, director, genre, and language; film copies, conserved and stored in archives, are different manifestations of the same intellectual work, e.g., several physical copies published on some specific dates or with censorship release dates; catalogue units, which are specific film sequences, from specific film copies, that are relevant from a scholarly point of view. We also introduced the concept of *Locus* (from Latin, place), which comprises all three kind of places we considered, that are: the *narrative place*, i.e., the either real or fictional place where the story events occur; the *displayed place*, i.e., the real world place used to portray the narrative place; and the *camera placement place*, i.e., the real world place where the camera was positioned while shooting (establishing a specific point of view). Within a film scene, these three types of places can coincide, as in the case of the well-known scene from *La Dolce Vita* directed by Federico Fellini, where the Trevi Fountain in Rome is shown to represent the Trevi Fountain itself, or can be entirely different, as in the case of *The Lord of the Rings* trilogy directed by Peter Jackson where most of the scenes set in the fictional *“Middle-Earth”* were shot in New Zealand mountainous regions. The model also allows for representing non-specific places, which refer to the archetype of a place and cannot be identified with a specific place. For instance, we would

describe as a generic “valley” a displayed place in an early twentieth-century film sequence, as we do not have any clues on where the scene was shot, but we certainly know that the scene depicts a valley. In our model, each *Locus* refers to the abstract concept of a place, which is independent of any specific representation or temporal manifestation, e.g., the Locus corresponding to the city of Rome remains the same whether it is depicted as it was in 1900 or in 2000. We modelled the temporal evolution of the *loci* by using a reification of properties that describe an entity within a specific time interval. For instance, the *Temporary Map Reference* and *Temporary Name* capture how the different spatial extent of a *Locus* and its name change over time, respectively. A set of such temporary properties that hold within some time interval and are associated with the same Locus constitutes what we define as a *Locus Over Time*, which describes the specific temporal manifestation of the Locus to which it refers. For example, the locus for the city of *Istanbul* have (at least) two different temporal characterisations, as its modern-day name, *Istanbul*, is different from the one held from 330 C.E. to 1453 C.E., *Constantinopoli*. Finally, we introduced the *Narrative Place Representation* entity to describe the specific representation of a narrative place, with a specific displayed place and (possibly) a specific camera placement place, in a film sequence (i.e., a catalogue unit). Attributes such as “has season in narrative”, “has part of the day in narrative”, and “has present person” contribute to enriching the narrative characterisation of a narrative place. Each entity in our model can be linked to external resources through specific properties. Indeed, we used “has type” property to link our model to external thesauri such as GettyAAT[17], while resources such as OpenStreetMaps¹ are referred to by “has map reference” property to define the spatial extent of a Locus. With this ontology-based model, we aim to support both an accurate documentation of films and related places and new forms of exploration of such resources. In particular, the demo we present is designed to enhance the analysis and navigation of film places, allowing users to explore the connections and parallelism between narrative places and displayed locations, together with their representation within film sequences.

3. System design and architecture

In the “Revisualising Italian Silentscapes 1896-1922 (RevIS)” project², we address this research gap, specifically focusing on silent movies produced in Italy in the early twentieth century, to study the urban transformations that occurred in that dynamic epoch.

The system architecture developed for the RevIS project integrates our ontology-based metadata model

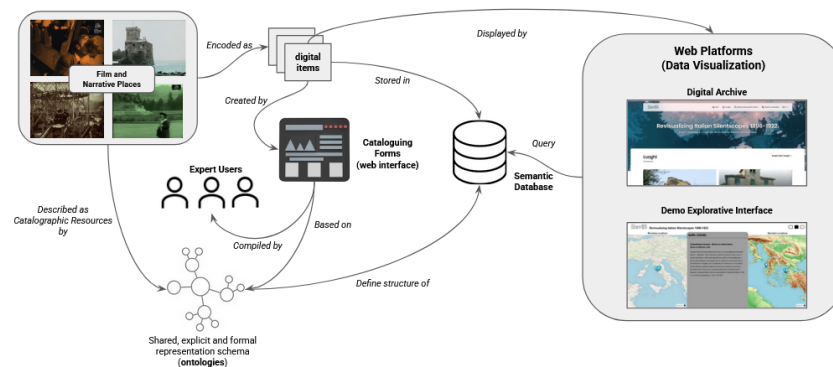


Figure 1: RevIS project workflow, from the conceptualisation of the items from the domain of interest, followed by their encoding and visualisation.

with expert-driven cataloguing, and web-based data access and visualisation, supporting a rich and structured exploration of film and places. Figure 1 illustrates the workflow we adopted, which begins with the identification of films and places to document, conceptualised as catalogue entities and encoded

¹<https://www.openstreetmap.org/>

²<https://silentscapes.eu>, visited on 31 July 2025.

as digital items. A web-based cataloguing interface guides expert users in structuring and describing such items, ensuring that data entered adheres to our semantically coherent model[18][19]. This process allows for an effective translation of the domain knowledge into machine-readable semantic data.

Once catalogued, digital items are stored as records in a semantic database built upon Omeka-S³, a Content Management System (CMS) which allows for importing custom metadata schemas and storing information according to that schema. The semantic database serves as the core of the system, allowing for advanced querying and structured retrieval of entities and their relationships, supporting both analytical and exploratory tasks. Two web-based platforms are built upon this infrastructure. The Digital Archive⁴ provides access to curated metadata and resources, allowing users to browse and search through the collection of films and places. On the other hand, the Demo explorative interface⁵ provides a digital map-based visualisation, enabling users to explore films starting from narrative places and their corresponding displayed locations. Both platforms query the semantic database, ensuring consistency and an ontology-driven navigation of the archive. Thanks to this architecture, semantic web technologies and structured domain knowledge can be integrated within a digital ecosystem, fostering new modes of exploring and engaging around cinematic production.

4. Demo

Through an interactive interface (Figure 2), users can navigate cinematic content spatially, visualising narrative places alongside their actual filming locations. Narrative and displayed places are arranged



Figure 2: Screenshot of the Demo Explorative Interface, <https://cataloguing-forms.silentscapes.eu/demo/>

in two different digital maps and identified with distinct visual markers, according to OpenStreetMap references inserted during the cataloguing process. Clicking on them reveals their connections with a film scene and the corresponding narrative (or displayed) place, together with other information such as the name, an illustrative image, and a short description of it, as shown in Figure 2. Users can also start from a film scene and visualise on a map its narrative and filming locations, revealing spatial patterns within a production. The dual-map parallel visualisation allows users to easily understand whether the narrative places correspond to the displayed ones or not, and perform a non-linear exploration of films. A challenge we encountered during the implementation of our demo was the positioning of visual markers for generic places. While this process is straightforward for specific places such as the *city of Rome* or *Piazza Vittorio Veneto in Torino*, for generic places, such as *Valley* or *Seascape*, we adopted a heuristic approach based on the geographical centres of the places where most of the film story is set, and most of the film sequences were shot, respectively. From there, the generic narrative

³<https://omeka.org/s/>

⁴<https://app.silentscapes.eu>

⁵<https://cataloguing-forms.silentscapes.eu/demo/>

and displayed places were randomly positioned around them, respectively. For instance, for the film *"Saffo"*, directed by *Aldo Molinari*, generic displayed places are arranged around the Rome city centre, while generic narrative places are arranged around the two islands of *Lesbo* and *Santa Maura* (*Leucade* in the past) in *Greece*. This solution allows for displaying on a digital map also such places that don't have a precise spatial collocation, giving some visual clues to users about where the film has been shot and the story is set. The bidirectional and non-linear navigation provided by the demo bridges semantic metadata and spatial visualisation, offering an intuitive interface that supports both scholarly research and public curiosity. Film scenes and places are directly linked to the digital archive, allowing users to deepen their knowledge about such elements. By centring the exploration of places rather than films, users can trace the cinematic history of locations, analyse the evolution of their representations through a comparison with other collections, and understand how narrative and filming spaces interact in the construction of meaning. This design shows the potential of semantic metadata-driven systems combined with interactive mapping to transform film archives from static repositories into dynamic platforms for analysing and discovering places through cinema.

Although the system has been developed for the RevIS project corpus, the demo interface we implemented can be applied to other film repertoires and case studies. The metadata schemata describes locations from more recent films; for example, the royal staircase of the *Royal Palace* of *Caserta* used to represent both a generic Vatican staircase in *"Conclave"*, directed by Edward Berger, and the *Royal Palace* of *Naboo* in *"Star Wars: Episode II - Attack of the Clones"*, directed by George Lucas. The same interface schema can go beyond the cinematographic production: for example, in the research of landscape evolution, the same spatial object can be represented differently in multiple historical maps (e.g., how the boundaries and the buildings of the city of Rome change through time), while in artistic studies, some places inspired or are portrayed in paintings as totally different places (e.g., the construction site of the *San Pietro Basil* in Rome portrayed as the *"School of Athene"* by Raffaello). Land and soil use studies can also benefit from this interface schema, as it can effectively represent their temporal evolution by putting side-by-side (or overlaying) different temporal stages of the land uses within a specific place (e.g., the changes in land use within the historical terraced vineyards of Carema[20]).

5. Evaluation and Conclusion

To evaluate the usability and perceived value of the system, we conducted a small-scale preliminary study involving 11 participants (54, 4%*F* and 45, 6%*M*), including both expert users (film scholars and professionals, 72, 7%) and non-expert users with a general interest in cinema (27, 3%). The evaluation focused on the Demo interface; feedback was collected on navigation, clarity of concepts, and perceived usefulness through a questionnaire with 11 questions in a Likert scale from *Totally disagree* (1) to *Totally agree* (5) plus a final open question for suggestions. Table 1 shows the results. The feedback

#Q	Question	Mean
#1	Clarity of the link between film sequence, narrative place, and the displayed place.	4,27
#2	Clarity of the difference between specific and generic places.	3,18
#3	Ease to browse between film sequences.	4,18
#4	Ease to browse between narrative places.	4,18
#5	Ease to browse between displayed places.	4,36
#6	Enough elements to understand the relationship between narrative and displayed places.	4,00
#7	Ease to use web interface to explore films and places.	3,81
#8	Efficacy of the link between demo interface and digital archive.	4,54
#9	Novelty of the exploration method.	4,09
#10	Understanding of the film production by exploring film places.	4,00
#11	The exploration method could improve digital film archive navigation.	4,63

Table 1

List of questions from the questionnaire with the corresponding mean.

was particularly positive towards the possibility of exploring film content through narrative places,

along with direct access to the digital archive for more in-depth research. Users appreciated the map-based visualisation and the synchronised view connecting narrative places with their real-world counterparts, as it allows for rapidly acknowledging the parallelism between them, and gives some clues about the film production. This approach was seen as an effective and engaging way to navigate film archives, offering new possibilities for representing and enhancing cinematic places. Indeed, the ontology-driven design, combined with spatial exploration, was recognised as a promising method for rethinking archival access. Applying this to modern film corpora could be even more noticeable, as it is becoming a common practice for modern big productions to choose diverse locations all around the world to reproduce a specific narrative location. This is especially true for imaginary narrative locations (e.g., the abovementioned *"Middle Earth"* and planet *"Naboo"*), or unreachable ones (e.g., the planet *"Mars"* in *"The Martian"*, directed by Ridley Scott). However, it would require a rethinking of the actual interface concerning the narrative locations, as it currently relies upon geo-referencing, which is not viable for imaginary locations. Some critical observations emerged concerning the positioning of generic places. However, these were not attributed to flaws in the metadata model, but rather as areas where the interface design and data visualisation could be improved to better handle different levels of certainty. In future work, we plan to refine the visualisation of places that cannot be directly referenced on a traditional map and expand the platform to allow exploration across multiple films sharing the same narrative or displayed places. Also, we aim to apply this methodology to other domains, such as the representation of places on historical maps, showing the parallelism between the past and the present. In this respect, we already tried to adapt the presented demo to another case study on the

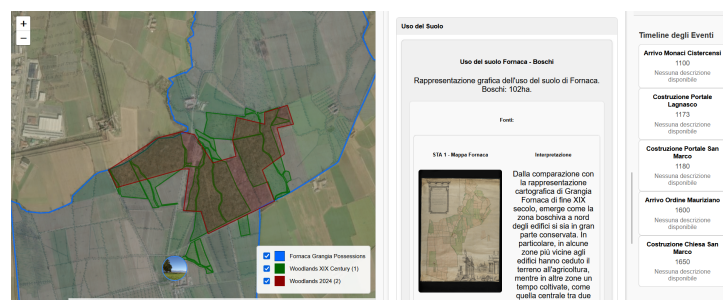


Figure 3: Screenshot of the Demo Explorative Interface, adapted to the Staffarda Abbey's case study, showing the satellite image of the site, overlaid with the historical map and land use polygons (on the left), the documental resources (at the centre), and the site's timeline of events (on the right).

agricultural historical landscape of Staffarda Abbey, as shown in Figure 3, for visualising the evolution of the soil use over time together with experts' interpretations and documental resources. However, it is still in the explorative stage. We believe that this place-centric exploration, when integrated with other heritage sources, holds strong potential for enriching both the cultural engagement and research practices.

Acknowledgments

We thank Silvio Alovio, Liliana Ardisson, Noemi Mauro, Livio Scarpinati, Angelo Geninatti Cossatin, and all the cataloguers who have populated the RevIS database (Project Revisualizing Italian Silentscapes 1896-1922, Italian Ministry of University and Research, PRIN 2020) and Luigi Provero, Federica Larcher, Paola Gullino, Paola Greppi, Enrico Pomatto (project CHANGES - Grant agreement no. PE00000020).

Declaration on Generative AI

During the preparation of this work, the author used Grammarly in order to: Grammar and spelling check. After using these tool, the authors reviewed and edited the content as needed and takes full responsibility for the publication's content.

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6. Online Resources

- Demo interface.