The Nuances of Mapping Street Art – Developing a Web Map for Interactive Graffiti Exploration

by OSKAR BAUMANN

Graffiti and street art are seen as cultural heritage by many [1] and are currently attracting increased research interest. Due to the characteristic ephemeral nature of graffiti, they rely on other media for dissemination and preservation [2].

These artistic expressions are highly contextual (see Fig.1) [3]. The map medium can reveal spatial relationships between graffiti and their surrounding environments, thus contextualizing and preserving these short-lived works.

There exist numerous (web) maps and archives dedicated to graffiti. Yet, the subject has not been formally approached from a cartographic perspective, which this research work sets out to do.

RESEARCH OBJECTIVES

1. To conduct a literature review on the spatial aspects of graffiti and to assess current graffiti-dedicated web maps.

2. To develop a web map prototype for exploring graffiti along Vienna's Donaukanal (Danube Canal), including adaptive graffiti symbols and a 3D map view.

3. To evaluate the prototype's user experience and usability through qualitative user testing.

Fig.1 – An example of a notably contextualized work of street art. Its nature themed content relates to the surrounding grassy urban environment.
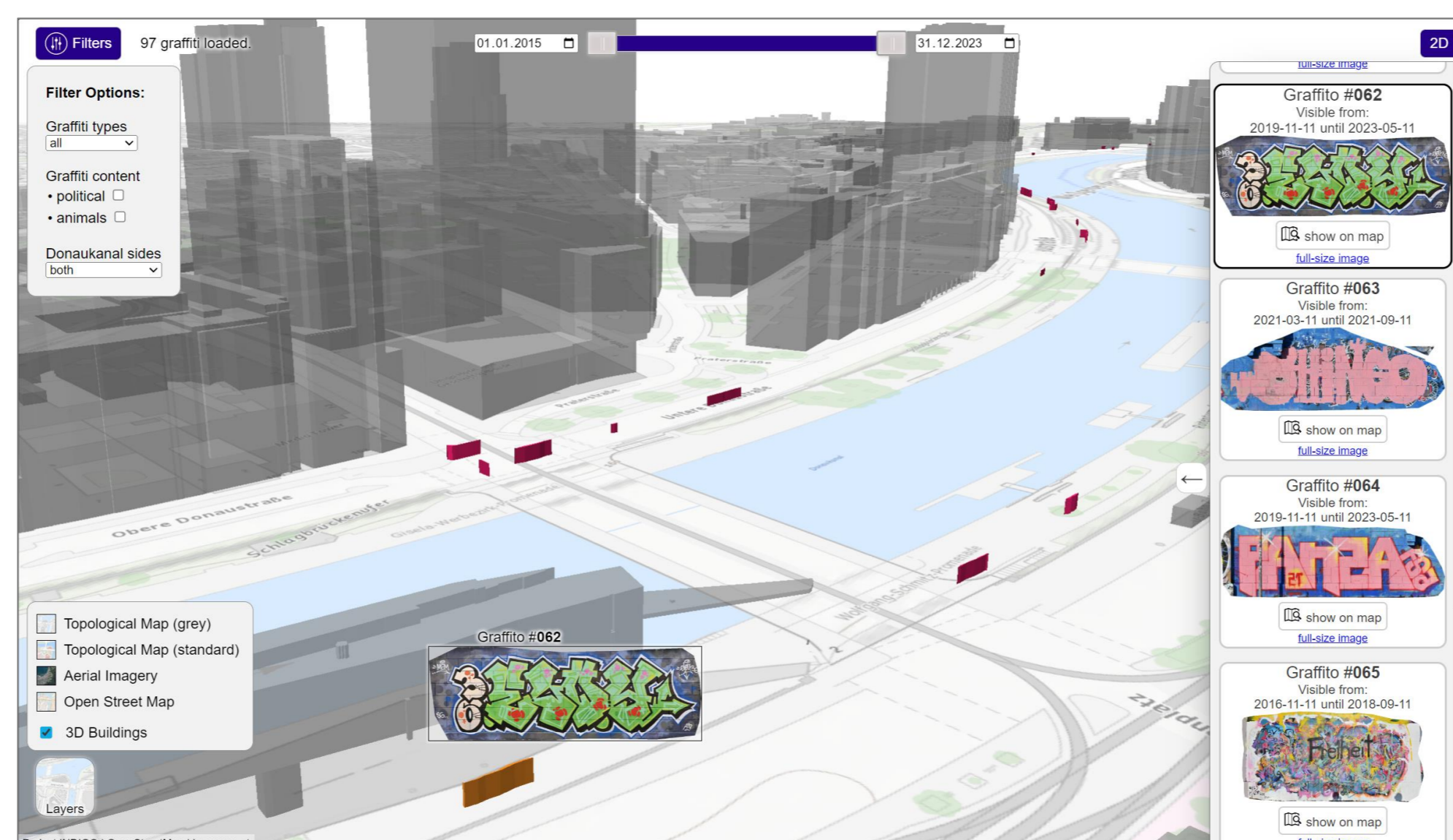

Fig.2 – The finalized web map prototype's interface (3D mode) allowing for immersive graffiti exploration along Vienna's Danube Canal (Donaukanal). Elements of the graphical user interface include a box containing filter options, a time slider (visibility), a map menu, and a side bar listing all currently visible graffiti.

VARIABILITY OF GRAFFITI

Graffiti and street art are rather (spatially) complex phenomena due to their variability. These creations come in many types, sizes, shapes, and orientations. Additionally, their individual boundaries are often ambiguous. In general, graffiti mostly cover flat, near-vertical surfaces.

WEB MAP DEVELOPMENT

The web map prototype (see Fig.2) for exploring graffiti data along the Danube Canal is created using the 'MapLibre GL JS' library. The prototype provides users with interaction operations [4], such as pan, zoom, retrieve, filter, reproject, resymbolize and search. Filtering options enable graffiti features to be queried spatially, temporally and semantically.

GRAFFITI GENERALIZATION

In the web map prototype's 2D mode, adaptive symbols are used to effectively represent graffiti across different zoom levels or map scales. When zoomed in closely, individual graffiti are represented by polygon geometries that closely approximate their actual shapes. As users zoom out to broader scales, more simple geometric representations are active, such as polylines or dynamic point clusters, to maintain optimal visual clarity.

QUALITATIVE USER STUDY

Qualitative user studies were conducted in which a total of 6 participants tested the finalized web map prototype. After initial familiarization with the prototype and its interface, participants were given tasks to complete – primarily using filters to locate specific graffiti features on the map. To gain insights on user experience and usability, mixed evaluation methods were used including observation of interaction, thinking-aloud protocols and semi-structured interviewing.

The user study results show that all participants successfully completed nearly all tasks, with an average completion time of 2-3 minutes per task. Both the 2D and 3D map modes were used by participants. The findings also highlighted certain trends in usability issues, with the visual prominence of graffiti map features emerging as a prominent concern.

CONCLUSION

Graffiti are suitable for mapping and make for rather complex main map features, mainly due to their inherent variability. The developed web map prototype demonstrates how current graffiti web maps could be enriched with adaptive graffiti symbolization and a 3D map mode option. Moreover, the prototype, while having some usability issues, proved successful in answering basic spatial, temporal, and semantic questions on graffiti.

REFERENCES

[1] Bonadio, E. (2022) 'Preservation and heritagisation of street art and graffiti', in Stamatoudi, I., Re-search Handbook on Intellectual Property and Cultural Heritage. Edward Elgar Publishing, pp. 170–190.

[2] de la Iglesia, M. (2015) 'Towards the scholarly documentation of street art', SAUC - Street Art and Urban Creativity, 1(1), pp. 40–49.

[3] Ferrell, J. and Weide, R.D. (2010) 'Spot theory', City, 14(1–2), pp. 48–62.

[4] Roth, R.E. (2013) 'An Empirically-Derived Taxonomy of Interaction Primitives for Interactive Cartography and Geovisualization', IEEE Transactions on Visualization and Computer Graphics, 19(12), pp. 2356–2365.