Article:
Westerholt, R, Mocnik, F and Comber, A orcid.org/0000-0002-3652-7846 (2020) A place for place: Modelling and analysing platial representations. Transactions in GIS, 24 (4). tgis.12647. pp. 811-818. ISSN 1361-1682

https://doi.org/10.1111/tgis.12647

GUEST EDITORIAL

A place for place – Modelling and analysing platial representations

René Westerholt[1] | **Franz-Benjamin Mocnik**[2] | **Alexis Comber**[3]

[1]School of Spatial Planning, TU Dortmund University, Dortmund, Germany

[2]Faculty of Geo-Information Science and Earth Observation, University of Twente, Enschede, the Netherlands

[3]School of Geography, University of Leeds, Leeds, UK

Correspondence
René Westerholt, School of Spatial Planning, TU Dortmund University, August-Schmidt-Straße 10, 44227 Dortmund, Germany.
Email: rene.westerholt@tu-dortmund.de

Funding information
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

This editorial presents a special collection of articles addressing the concept of place and its use in Geographical Information Science (GIScience). The concept of place is a topic of increasing interest among GIScience scholars. First attempts to formalise platial information have been made and it is increasingly discussed that user-generated datasets in particular are often more platial than spatial in nature. At the same time, and especially when compared to geometric spatial concepts, the concept of place is ambiguous, complex and difficult to capture in formal and analytical terms, suggesting the need for interdisciplinary approaches. This collection presents articles covering a wide range of place-related aspects, including both conceptual and more applied contributions. In the present editorial we summarise these and comment on their individual contributions, and hope that the readership of Transactions in GIS will find the special collection inspiring and informative.

1 | INTRODUCTION

Places are understood as locations and areas to which anthropogenic meaning is ascribed (Cresswell, 2015). As such, place and places have long been of interest to philosophers and geographers alike, and a large body of discursive and qualitative literature has developed around this topic. For scholars who use more quantitative and formal approaches such as in Geographical Information Science (GIScience), however, the topic of place is at first glance not a natural

domain within which to undertake research. While geometrical space is abstract and thus open to formalisation, places are often intimate and subjective, making them open to value assignment (Tuan, 1977). This distinction between space and place is further reflected in the split between those who work more idiographically, drawing on the humanistic traditions of geography, and those who view geography nomothetically as a scientific form of inquiry (Kwan and Schwanen, 2009), with GIScience being a contemporary example of the latter. The main reason for this difference is that any nomothetic undertaking seeking law-like statements and regularities has to make simplifying assumptions (Cresswell, 2015). This is contrary to some of the key ideas underlying the investigation of place within humanistic, radical and other human-geographic traditions.

Consideration of place by GIScience scholars has increased over recent years due to the greater availability of platial data from diverse sources. These include large repositories of social media data, blogs, tagged photographs, etc. (MacEachren, 2017; Bahrehdar and Purves, 2018; Wu et al., 2019). However, while digital (though often reductionist) representations of places have been discussed (Westerholt, 2019a,b; Jenkins, 2016; Quesnot and Roche, 2015), the inherent vagueness in the definition of place has so far limited the progress on platial concepts within GIScience. The concept of place in GIScience is therefore still in its infancy. Recently, some progress has been made, as is evident in a number of outlook and foresight articles (Goodchild, 2015; Sui and Goodchild, 2011) as well as review articles (Hamzei et al., 2020; Wagner et al., 2020; Purves et al., 2019; Merschdorf and Blaschke, 2018). First conceptual and methodical attempts to analytically assess place (Mayer et al., 2020; Scheider and Janowicz, 2014; Gao et al., 2013; Winter and Freksa, 2012) and develop corresponding visualisation approaches (Bleisch and Hollenstein, 2018; Mocnik and Fairbairn, 2018; Westerholt et al., 2018a). Yet, there is still a lack of a holistic consistent theory of how places can be characterised, represented and used in a formal way. A place-based approach to GIS and analysis is nevertheless important given the wealth of increasingly place-based information available to us in an increasingly digital world. Digital technologies are now strongly integrated into everyday life, with the result that a large number of mainly urban datasets (e.g. geo-social media feeds, online blogs, etc.) routinely capture how people use and represent places in subjective and sometimes idiosyncratic ways. In order to make full use of these often user-generated datasets, a thorough understanding of the concept of place is required.

Recently, the need for representational models, analytical approaches and visualisation methods to address place has become apparent. This demand is reflected in events such as the PLATIAL symposium series (Mocnik and Westerholt, 2020; Westerholt and Mocnik, 2020; Westerholt et al., 2018c,b), the GeoCultGIS workshop at AGILE 2019 (Grinberger et al., 2019), the 'Speaking of Location' workshop at COSIT 2019 (Stock et al., 2019), and the upcoming 'Semantic technology for geographic question answering' workshop at the GIScience 2020 Conference (Tomko et al., 2020), to name but the most recent examples. This increasing engagement of GIScience scholars with place sets out the motivation for the convening of this special collection. The current shift towards a stronger emphasis on human aspects and a stronger focus on human-geographical concepts render this special collection a timely contribution within the current place discourse in GIScience.

2 | AIMS OF THIS SPECIAL COLLECTION

This special collection is organised around a number of questions that we believe are important for further progress on the integration of place with GIScience:

- How can we integrate and align GIScience notions of place with human-geographic and philosophical notions?
- How is it possible to establish and quantify relationships between adjacent places?

- What might be a suitable strategy for aggregating subjective platial information?
- What roles do uncertainty and fuzziness take in a platial theory of geoinformation?
- In which ways can places be visualised, and how can we do that at multiple scales?
- What can we learn about places from volunteered and ambient geographic information?
- How can platial analysis be integrated with applied research agendas from neighbouring disciplines like sociology, urban planning, cognitive science, or human geography?

To make it easier to organise the published articles in the following section into a summary, we have grouped the above questions into five categories, which we can assign to the contributions of the individual articles:

1. Links to human-geographic place concepts
2. Platial GIS/GIScience concepts, operations and methods
3. Visualisation of place
4. Place and volunteered/ambient geographical information
5. Interdisciplinary integration with agendas of neighbouring fields

These categories demonstrate that this special collection contains articles covering a broad thematic spectrum around the theme of place. The collection touches on basic topics such as underlying links to the geographical literature, extends to the applied field of using Volunteered (Goodchild, 2007) and Ambient (Stefanidis et al., 2013) Geographical Information, and transcends GIScience by extending to adjacent disciplines. This broad scope makes the special collection a resource for GIScience scholars and researchers from cognate disciplines alike. The subsequent section provides an overview of the works contained in the special collection and a summary of how they address the five categories above.

3 | OVERVIEW OF THE ARTICLES

The special collection consists of six articles. The following blocks give brief introductions to the individual articles:

Acedo and Johnson (2020) This article questions the way we collect data about people and their social realities. The two concepts of home range and habitat are borrowed from ecology and related to the human concepts of home and neighbourhood. The home range is defined as the geographical area in which people live and to which they react in cognitive, affective and behavioural terms. Similarly, habitat is then roughly described as the area that literally keeps one alive in terms of daily living and social relations. The latter is thus a mixture of locale (Agnew, 1987) and social capital (Bourdieu, 1984). These concepts are operationalized by means of a Web GIS, through which residents of Lisbon, Portugal, were asked to contribute their personal home ranges and habitats, as defined above. The results show striking differences between spatially defined administrative areas and those constructed by people bottom up. It is apparent that for any analysis using spatial units, the results would vary significantly between the different concepts presented and compared in this article.

Giordano and Cole (2020) The authors develop from given narratives possible components of a platial concept of GIS. Using the triple of location, locale, and sense of place (Agnew, 1987), they examine testimonies of Holocaust survivors in order to construct the image of emotionally charged places such as concentration camps on different scales (from the division of concentration camps to the continental scale in the narratives reflecting their depor-

tations). In this way, the article sheds light on a number of factors that are very important for the way the place is contained and communicated in the narratives. For example, the article reports on how everyday spatial restructuring in the barracks occupancy was crucial in shaping the sense of place in a concentration camp. Also on a larger scale, the narratives make clear how the constant change of venue (and thus the loss of place) in connection with the flight and the change between hiding places was crucial for the locale of the interviewees, which also had an impact on their social networks.

Lai et al. (2020) Starting from place as a function of name, location, activity and time, this article presents an approach to derive place information from geosocial media data. In a first step, the authors extract possible place names from the text component of Twitter data from the Borough of Camden, London, which is the area of investigation used in the case study presented in this article. This is done using text mining and the *H* function from point pattern analysis (Kiskowski et al., 2009) to find locally clustered names. To determine the spatial extent of places, the DBSCAN clustering method (Ester et al., 1996) is then applied before activities are derived using the Latent Dirichlet Allocation (Blei et al., 2003). In a final step, the extracted place profiles are compared to a database of check-ins extracted from Foursquare. In this way, 67% of all places extracted in the case study was found to match up with corresponding Foursquare venues. Given the noisy character of Twitter data, this is a promising result.

Ballatore and De Sabbata (2020) This study compares different digital place representations of Los Angeles County, United States. The platforms considered include Twitter, Wikipedia, OpenStreetMap and Foursquare. While it is to be expected that these platforms would offer different types of place representations due to their quite different nature, it is less known whose places are reflected in the different datasets. For this reason, the authors have related the different place representations to geodemographic and socioeconomic factors. The results show interesting and partly unexpected patterns. For example, it is noteworthy that the place representations extracted from Twitter seem to be more strongly associated with densely populated, disadvantaged areas of Los Angeles, even though this may in part be an effect of the city's topography. OpenStreetMap and Foursquare-related place representations in turn correlate with white, affluent, educated areas. In general, Wikipedia seems to behave differently than the other datasets studied. Overall, the presented results show that different user-generated geographical datasets reveal different aspects about places, which motivates cross-platform approaches.

Tang et al. (2020) The authors examine features that can act as invariant connectors between sketched maps and the physical world. The aim is to learn about features such as the category, shape, name, and relative size of sketched objects, and to what extent these features enable us to link people's sketched ideas about a place with (spatial) topographic maps. To test these features, an empirical study was conducted with volunteers who sketched parts of a campus of Nanjing Normal University in China. The results show that the categories of regions, the topological relationships between minor and major roads, and the shapes of major roads are suitable links that can be used to anchor the maps drawn by people in a local topography. These findings are promising and will be an important impulse for platial primary data acquisition, an area that is not yet sufficiently addressed in the GIScience literature.

Iosifescu Enescu et al. (2020) This article focuses on dreams and the way people experience places while sleeping. The aim is to derive novel visualisation techniques that can be used to represent dream lands, including the dreamer's sense of place and familiarity with places. Two concepts are proposed: place cookies and setting spiders. Place cookies are used to indicate how familiar one is with a place. Since it is a univariate measure that indicates different levels of familiarity with a place in the form of layers on the cookie, place cookies can be used as point markers on maps. This way, the cookie represents both spatial and platial distance (using different concepts of distance) at the same time. The second concept of a setting spider is based on a radar chart. It is populated with

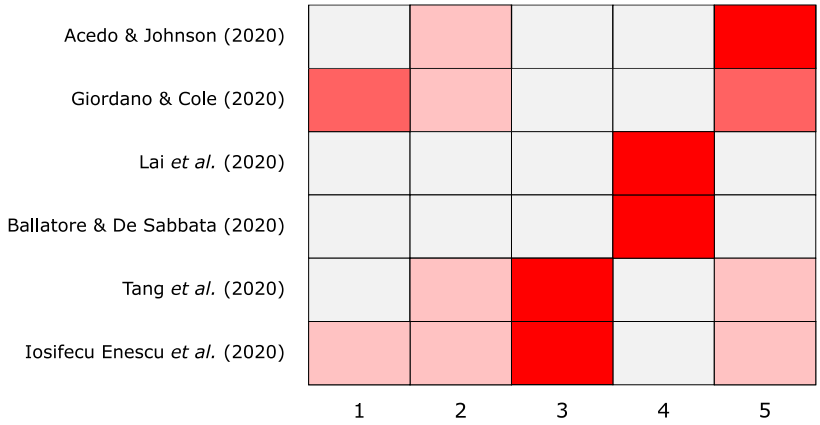

FIGURE 1 Overview of the thematic foci of the contributions presented in this special collection. The column labels correspond to the following categories enumerated in Section 2: (1) Links to human-geographic place concepts, (2) Platial GIS/GIScience concepts, operations and methods, (3) Visualisation of place, (4) Place and volunteered/ambient geographical information, (5) Interdisciplinary integration with agendas of neighbouring fields. The shading intensity indicates the degree to which each article addresses each theme.

axes after a number of relevant characteristics from real dream reports have been evaluated. The characteristics derived in this way are then grouped into eight factors, which serve as axes in the spider chart.

We have extracted the emphases from each article and summarised them in terms of the categories presented in Section 2, the outcome of which is visualised as a heat map (Figure 1). It is apparent that the articles in this special collection are grouped into three main groups: visualisation of place (3), place and volunteered/ambient geographic information (4) and interdisciplinary approaches that reach into other disciplines (5). Interestingly, the visualisation approaches do not stand on their own, but are accompanied by further considerations of conceptual aspects of platial information. The authors of these articles have therefore not only made a contribution to the topic of visualisation or cartography, but have also embedded their work in proposals for basic characteristics of the modelling and formalisation of places. A second cluster includes work that reaches into other disciplines. This was done in two ways: by applying methods from other disciplines and by adapting concepts from other disciplines. In both cases, these were accompanied by considerations of the conceptual foundations of place in GIScience. The third cluster is more self-contained and focuses on the use of volunteered/ambient geographic information. This is probably explained by the nature of these works, both of which are presented in the form of case studies focusing on specific places.

4 | CONCLUSIONS AND FUTURE DIRECTIONS

The special collection presented in this issue of Transaction in GIS provides a snapshot of the place-related consideration in GIScience, covering various aspects of the topic. All of the articles identify and discuss a number of relevant points that will help moving the topic further in the field. Based on the articles published and our discussions provided above, we want to close this editorial with conjectures about three possible future directions.

The treatment of conceptual and methodological contributions together with various other forms of investigation

across the articles in this special collection shows that the authors approach the conceptualisation of platial information from a variety of perspectives. This suggests the great potential of the topic of place to open the field of GIScience to other related disciplines. This happens widely mainly in the form of applications, for instance, using GIS or spatial analysis. As most approaches to place found in GIScience remain within the well-known and well-developed spatial paradigm (Comber et al., 2018), place could be a topic that demands exactly this: the inclusion of and the engagement with concepts from other fields and their integration into the conceptual core of GIScience.

All presented works remain within the spatial paradigm and are oriented towards the core concepts of spatial information presented by Kuhn (2012). It will be interesting to see whether further GIScience research will continue to attempt to formalise the concept of place using these existing concepts (as Purves et al. (2019) conjectured), or whether completely new paradigms beyond the geometric concepts of GIS and spatial analysis will emerge in the near future.

Social media and other forms of user-generated data play an important role in the place discourse of GIScience (Wagner et al., 2020). It will be interesting to see to what extent this will contribute to our more formal understanding of place. This area of place research in GIScience requires nuanced methodological approaches to extract meaningful information, since user-generated data are often complex to understand and embedded in frequently difficult to grasp contexts. It is to be expected that the drive to analyse these datasets will lead to a more complex methodological approach adapted to place, which could possibly be transferred to other domains.

references

Acedo, A. and Johnson, P. A. (2020) Home range and habitat: Using platial characteristics to define urban areas from the bottom up. *Transactions in GIS*, **24**, n/a.

Agnew, J. A. (1987) *Place and politics: The geographical mediation of state and society*. Boston, MA: Routledge.

Bahrehdar, A. R. and Purves, R. S. (2018) Description and characterization of place properties using topic modeling on georeferenced tags. *Geo-spatial Information Science*, **21**, 173–184.

Ballatore, A. and De Sabbata, S. (2020) Los Angeles as a digital place: The geographies of user-generated content. *Transactions in GIS*, **24**, n/a.

Blei, D. M., Ng, A. Y. and Jordan, M. I. (2003) Latent dirichlet allocation. *Journal of Machine Learning Research*, **3**, 993–1022.

Bleisch, S. and Hollenstein, D. (2018) Exploratory geovisualizations for supporting the qualitative analysis and synthesis of place-related emotion data. *Cartographic Perspectives*, 30–46.

Bourdieu, P. (1984) *Distinction: A social critique of the judgement of taste*. Cambridge, MA: Harvard University Press.

Comber, A., Butler, A., Malleson, N. and Schafran, A. (2018) Quantitative platial analysis: Methods for handling and representing platial heterogeneity and linking varying concepts of place. In *Proceedings of the 1st Workshop on Platial Analysis (PLATIAL'18)* (eds. R. Westerholt, F.-B. Mocnik and A. Zipf), 7–14. Heidelberg, Germany.

Cresswell, T. (2015) *Place. An introduction*. Chichester, UK: John Wiley & Sons, 2 edn.

Ester, M., Kriegel, H.-P., Sander, J. and Xu, X. (1996) A density-based algorithm for discovering clusters in large spatial databases with noise. In *Proceedings of 2nd International Conference on Knowledge Discovery and Data Mining (KDD-96)* (eds. E. Simoudis, J. Han and U. Fayyad), vol. 96, 226–231.

Gao, S., Janowicz, K., McKenzie, G. and Li, L. (2013) Towards platial joins and buffers in place-based GIS. In *ACM SIGSPATIAL COMP'13*, 42–49. Orlando, FL.

Giordano, A. and Cole, T. (2020) Places of the holocaust: Towards a model of gis of place. *Transactions in GIS*, **24**, n/a.

Goodchild, M. F. (2007) Citizens as sensors: The world of volunteered geography. *GeoJournal*, **69**, 211–221.

— (2015) Space, place and health. *Annals of GIS*, **21**, 97–100.

Grinberger, A. Y., Novack, T., Schultz, M., Mooney, P. and Zipf, A. (eds.) (2019) *Proceedings of the "Geographical and Cultural Aspects of Geo-Information: Issues and Solutions" AGILE 2019 Workshop (GeoCultGIS 2019).* Limassol, Cyprus.

Hamzei, E., Winter, S. and Tomko, M. (2020) Place facets: a systematic literature review. *Spatial Cognition & Computation*, **20**, 33–81.

Iosifescu Enescu, C. M., Bär, H.-R., Beilstein, M. and Hurni, L. (2020) Place cookies and setting spiders in dream cartography. *Transactions in GIS*, **24**, n/a.

Jenkins, A. (2016) *Discovering A Collective Sense of Place Through Crowd-Generated Content*. Ph.D. thesis, Fairfax, VA.

Kiskowski, M. A., Hancock, J. F. and Kenworthy, A. K. (2009) On the use of Ripley's K-function and its derivatives to analyze domain size. *Biophysical Journal*, **97**, 1095–1103.

Kuhn, W. (2012) Core concepts of spatial information for transdisciplinary research. *International Journal of Geographical Information Science*, **26**, 2267–2276.

Kwan, M.-P. and Schwanen, T. (2009) Quantitative revolution 2: The critical (re)turn. *The Professional Geographer*, **61**, 283–291.

Lai, J., Lansley, G., Haworth, J. and Cheng, T. (2020) A name-led approach to profile urban places based on geotagged twitter data. *Transactions in GIS*, **24**, n/a.

MacEachren, A. M. (2017) Leveraging big (geo) data with (geo) visual analytics: Place as the next frontier. In *Spatial Data Handling in Big Data Era* (eds. C. Zhou, F. Su, F. Harvey and J. Xu), 139–155. Singapore: Springer.

Mayer, M., Heck, D. W. and Mocnik, F.-B. (2020) Shared mental models as a psychological explanation for converging mental representations of place – the example of OpenStreetMap. In *Proceedings of the 2nd International Symposium on Platial Information Science (PLATIAL'19)*, 43–50.

Merschdorf, H. and Blaschke, T. (2018) Revisiting the role of place in geographic information science. *ISPRS International Journal of Geo-Information*, **7**, 364.

Mocnik, F.-B. and Fairbairn, D. (2018) Maps telling stories? *The Cartographic Journal*, **55**, 36–57.

Mocnik, F.-B. and Westerholt, R. (eds.) (2020) *Interdisciplinary perspectives on place. Proceedings of the Second International Symposium on Platial Information Science (PLATIAL'19).* Coventry, UK.

Purves, R. S., Winter, S. and Kuhn, W. (2019) Places in information science. *Journal of the Association for Information Science and Technology*, **70**, 1173–1182.

Quesnot, T. and Roche, S. (2015) Platial or locational data? Toward the characterization of social location sharing. In *Proceedings of the 48th Hawaii International Conference on System Sciences* (eds. T. X. Bui and R. H. J. Sprague), 1973–1982. Los Alamitos, CA: Conference Publishing Services.

Scheider, S. and Janowicz, K. (2014) Place reference systems: A constructive activity model of reference to places. *Applied Ontology*, **9**, 97–127.

Stefanidis, A., Crooks, A. and Radzikowski, J. (2013) Harvesting ambient geospatial information from social media feeds. *GeoJournal*, **78**, 319–338.

Stock, K., Jones, C. B. and Tenbrink, T. (eds.) (2019) *Proceedings of the Workshop on Speaking of Location 2019: Communicating about Space (SoL 2019).* Regensburg, Germany.

Sui, D. and Goodchild, M. F. (2011) The convergence of GIS and social media: challenges for GIScience. *International Journal of Geographical Information Science*, **25**, 1737–1748.

Tang, M., Falomir, Z., Freksa, C., Sheng, Y. and Lyu, H. (2020) Extracting invariant characteristics of a sketched place: Towards place query-by-sketch. *Transactions in GIS*, **24**, n/a.

Tomko, M., Scheider, S., Koubarakis, M. and Lafia, S. (2020) *Semantic Technology for Geographic Question Answering (GIScience 2020)*. URL: `http://spatial.ucsb.edu/giscience-geoQA-2020`. Accessed 3 May 2020.

Tuan, Y.-F. (1977) *Space and place: The perspective of experience*. Minneapolis, MN: University of Minnesota Press.

Wagner, D., Zipf, A. and Westerholt, R. (2020) Place in the giscience community–an indicative and preliminary systematic literature review. In *Proceedings of the 2nd International Symposium on Platial Information Science (PLATIAL'19)* (eds. F.-B. Mocnik and R. Westerholt), 13–22. Coventry, UK.

Westerholt, R. (2019a) Methodological aspects of the spatial analysis of geosocial media feeds: from locations towards places. *gis.Science: Die Zeitschrift für Geoinformatik*, **31**, 65–76.

— (2019b) Statistische Räumliche Analyse in der Digitalen Transformation: das Beispiel Geosozialer Medien. In *Geoinformationssysteme 2019—Beiträge zur 6. Münchner GI-Runde* (eds. T. H. Kolbe, R. Bill and A. Donaubauer), 29–35. Munich, Germany: Runder Tisch GIS e.V.

Westerholt, R., Gröbe, M., Zipf, A. and Burghardt, D. (2018a) Towards the statistical analysis and visualization of place. In *Proceedings of the 10th International Conference on Geographic Information Science (GIScience 2018)*. Schloss Dagstuhl-Leibniz-Zentrum für Informatik.

Westerholt, R. and Mocnik, F.-B. (2020) Introduction to the Second International Symposium on Platial Information Science. In *Proceedings of the 2nd International Symposium on Platial Information Science (PLATIAL'19)* (eds. F.-B. Mocnik and R. Westerholt), 1–3. Coventry, UK.

Westerholt, R., Mocnik, F.-B. and Zipf, A. (2018b) Introduction to the PLATIAL'18 Workshop on Platial Analysis. In *Proceedings of the 1st Workshop on Platial Analysis (PLATIAL'18)* (eds. R. Westerholt, F.-B. Mocnik and A. Zipf), 1–5. Heidelberg, Germany.

Westerholt, R., Mocnik, F.-B. and Zipf, A. (eds.) (2018c) *On the way to platial analysis: Can geosocial media provide the necessary impetus? Proceedings of the 1st Workshop on Platial Analysis (PLATIAL'18)*. Heidelberg, Germany.

Winter, S. and Freksa, C. (2012) Approaching the notion of place by contrast. *Journal of Spatial Information Science*, **2012**, 31–50.

Wu, X., Wang, J., Shi, L., Gao, Y. and Liu, Y. (2019) A fuzzy formal concept analysis-based approach to uncovering spatial hierarchies among vague places extracted from user-generated data. *International Journal of Geographical Information Science*, **33**, 991–1016.