Spatial Digital Archaeology and History in Israel

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This special issue of JJAR is largely a result of a workshop on digital spatial archaeology conducted in the National Library of Israel in 2021 in the wake of the establishment of two cutting-edge national knowledge centers for the history and heritage of Jerusalem and its environments (below). Several other spatial projects were invited to participate in the workshop in order to share information and ideas and brainstorm new options and directions.

Both centers were supported by a grant from Israel's Ministry of Innovation, Science, and Technology (MOIST), the focus of which has long been on natural, engineering, and applied sciences. However, in special cases, it has been open to funding innovative interdisciplinary research projects of broader scope. The decision to open a call for proposals for establishing a national knowledge center on the history of Jerusalem (eventually divided in two) stemmed from the ministry's efforts to foster the digital humanities in Israel and expand its research support portfolio through sustainably enhancing collaborations between scholars from the humanities and related fields, on the one hand, and the computer sciences and related fields, on the other. The selection of Jerusalem as a test case stems from the city's uniqueness and rich history. The ministry assumes that the broad, interdisciplinary, and growing field of the digital humanities could significantly benefit from long-term cooperations encompassing governmental and semi-governmental funding agencies, private donors and foundations, the academic community, and lay citizens.

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While the projects described in this special issue can be seen as partaking in what is sometimes called the *spatial turn* in the humanities, and they are certainly part of the growing interest in the digital humanities at large (e.g., Warf and Arias 2009; Bodenhamer, Corrigan, and Harris 2010; Gregory and Geddes 2014; da Silveira 2014), we note that archaeological studies always built on maps and relied on spatial analyses. Indeed, biblical archaeology was preceded by historical geography, which is essentially an effort to place historical information in space (e.g., Smith 1889; Kallai 1967; Aharoni 1979). Still, the development of geographic information system technology (GIS) transformed our ability to analyze this data (e.g., Conolly and Lane 2006). Analyses that once required hours and even days of work can now be performed in seconds. This quantitative leap is so great that it amounts to a qualitative revolution, enhancing our ability to study spatial data. We note that Israeli archaeology's capacity to contribute to the field is considerable, as we have incomparably large and accessible archaeological datasets.

The region's vast amount of archaeological and historical information, which is extraordinary at a global scale, is due to the great interest of scholars worldwide in the archaeology and history of the Holy Land. This interest resulted in hundreds of planned, academically initiated excavations and extensive surveys. The data produced by these projects is further augmented by the strict enforcement of the Israeli Law of Antiquities, which requires that archaeological surveys be conducted in anticipation of development work and that salvage excavations be carried out when antiquities are discovered. Given the high intensity of development across the country, many thousands of salvage excavations have been carried out in Israel over the years (e.g., Faust and Safrai 2015; 2022).

Compared to most other countries, the archaeological and historical data produced for sites and monuments in Israel is more systematically recorded and archived and, therefore, more accessible. This, too, is a consequence of the Israeli Law of Antiquities (1978). Building on preceding Ottoman and British legislation, this law demands that every archaeological excavation and survey in Israel be licensed by the director of the Israel Antiquities Authority (IAA). Among other things, the license holder is obliged to submit all the technical documentation produced by the excavation, as well as the final report, to the IAA archives. These archives store the data from all excavations and surveys in one central location, which is accessible both physically and digitally (full digital access will be completed in the coming years). Thus, all archaeological materials produced under the British Mandate (1918–1948) and the State of Israel (1948 to the present) are potentially available for research.

Additionally, valuable information on historical monuments is found in historical cities' local archives, such as the Jerusalem municipality archives (see Hysler Rubin, this volume). The National Library's rich collection of books, manuscripts, documents, maps, and photographs is another comprehensive nationwide database. These centralized data collection systems constitute huge repositories of information on numerous aspects of the country's history and archaeology. The collation and management of these data as a resource for research on specific topics is presented throughout this issue, particularly in the articles by Patrich and Di Segni and Hysler Rubin.

Combining these unparalleled datasets with the new tools provided by the digital humanities, the field's potential becomes hard to exaggerate. The articles in this special issue present projects that develop special digital tools to analyze these uniquely rich databases. Most projects are still ongoing. Therefore, many papers in this issue offer preliminary descriptions, sometimes referring to existing online platforms and sometimes only presenting the project in outline.

The paper by Maayan Zhitomirsky-Geffet and Yuval Krymolowski, *Integrating GIS and Semantic Web Technologies as a Next Step in the Evolution of Spatial Digital Humanities,* provides an overview of the development of the spatial digital humanities. To an extent, it also serves as an introductory article to this special issue. Zhitomirsky-Geffet and Krymolowski note how the development of information technology instigated many projects that aimed at the digitization, organization, visualization, and analysis of historical information. Geographic information systems were typically used to generate various kinds of spatial data, like the position of archaeological finds. The authors argue that the spatial digital humanities will carry the emerging field of spatial history a step further by augmenting spatial data with cultural and historical information derived from numerous sources, like books, administrative documents, historical photos, and maps, facilitating a much deeper understanding of the cultural and social fabric of different places. In order to promote standardization and integration, uniform data modeling, open-access and cross-project data sharing and analysis, ontologies, and modern semantic web technologies are integrated with GIS technology. Zhitomirsky-Geffet and Krymolowski review this integrated approach, discuss several recent digital humanities attempts to apply it to cities across the globe, and address this emerging field's main challenges and possible solutions.

The following two articles present the fruits of the national knowledge centers for the study of the history and heritage of Jerusalem and its environment established at Bar Ilan University and at the Hebrew University of Jerusalem, the Israel Antiquities Authority, and the National Library of Israel and supported by

MOIST. Avraham Faust and Roni Shweka's paper, *LISROP: A New Platform for the Spatial Analysis of Massive Archaeological and Historical Information (a Work in Progress)*, presents the Land of Israel Study and Research Online Platform (LISROP), which is currently being developed at Bar-Ilan University. It is an integrative bilingual (English and Hebrew) online platform that aims to provide scholars and non-academics with sophisticated GIS tools, some developed specifically for the platform, to review, explore, and dissect a vast amount of archaeological and historical data. The platform can be used for various types of studies; it can also be expanded thematically and spatially by including additional databases and applications and providing information on ecology, culture, and heritage.

The paper presents the project's background, history, and development, and the platform's current aims (reflecting on the development over the past few years). Next, it describes the platform and its components, including the geographical foundations, the archaeological and historical data it incorporates, and the various GIS elements it includes. The paper then outlines the platform's potential and capacity to advance research on a number of levels. In this section, the authors also comment on the platform's potential benefits for non-academics. The paper ends with a brief description of a few major challenges encountered during the work and some plans for expanding the platform.

The issue's third paper is authored by Gideon Avni, Alex Altshuler, Tsafra Siew, Liat Weinblum, Tal Ulus, and Ronnie Ellenblum and titled *The Ronnie Ellenblum Jerusalem History Knowledge Center: Conceptual Framework and Implementation*. It describes the vision, framework, challenges, and implementation of the Jerusalem History Knowledge Center initiated by the late Ronnie Ellenblum to integrate data on Jerusalem from numerous sources. The center was established as a joint project of the Hebrew University of Jerusalem, the National Library of Israel, and the Israel Antiquities Authority. Its primary mission and challenge are to establish a long-term digital infrastructure that will provide an open-access platform for accessing knowledge about the history of Jerusalem from a wide range of sources. These sources include archaeological finds and observations, historical documents, pilgrim narratives, old and new pictures and videos, architectural reconstructions, and many more. The first step included two data classification case studies: the Citadel—Tower of David and the Damascus Gate. This included implementing a unified search environment for interdisciplinary databases based on a specific geographical area or a single monument. The center's products will eventually be available at two levels: the research level in the fields of history, archeology, art, geography, and the social sciences and the popular level for the public.

The three following papers describe field and topic-specific, academic projects. The paper by Avraham Yoskovich, Or Rappel-Kroyzer, Yanir Marmor, Sarel Levi, and Eyal Ben-Eliyahu, *ALMA Digital Atlas of the Ancient Jewish World: An Introductory Essay*, presents a project hosted by the University of Haifa. It aims to create a comprehensive digital-analytical atlas for ancient Jewish geography, which could be used as a tool for comparative research. Toponyms and locations relating to Jews are compiled from literary sources spanning the Hellenistic and Byzantine periods to facilitate comparisons of geographic information across various sources, formulate geographic questions, and suggest solutions. In doing so, the atlas will enable the creation of "mental maps," provide a geographic perspective on ancient Judaism and its literature, and facilitate comparative research. The article describes the project's aims, the database's construction, the corpora on which it is based, its features, and the pitfalls and challenges of constructing a digital atlas. The paper uses the mapping of the biblical Table of Nations in chosen sources to demonstrate the atlas's potential. While the Jewish sources from these periods were studied extensively from multiple perspectives, ALMA provides a unique geographic tool with multidimensional ramifications for cultural and historical research.

Joseph Patrich and Leah Di Segni's paper, *A Digital Corpus of Early Christian Churches and Monasteries in the Holy Land: Objectives and Structure*, presents a comprehensive digital database assembled and constructed in the course of a seven-year-long project (2014–2021) at the Hebrew University of Jerusalem. The database incorporates all published architectural, archaeological, geographical, textual, and epigraphical data pertaining to early Christian churches (n=715) and monasteries (n=306). The article details the project's objectives and the database's structure and includes an appendix outlining the templates of each section of the digital corpus. The corpus's sections are designed according to preconceived queries, facilitating the generation of reports concerning geographical distribution, architectural components and members, terms mentioned in inscriptions, and more. This is accompanied by a Google search function for the entire database. When completed, the database will be fully open to the public.

Noah Hysler Rubin's paper, *Digitizing Urban Heritage: The Digitization of Jerusalem Architectural Archives*, presents the Jerusalem Architectural Archives database, devised at the School of Architecture, Bezalel Academy of Arts and Design, Jerusalem. The database's construction is supported by the Jerusalem Development Corporation and conducted in collaboration with the Jerusalem Municipality, the National Library of Israel, and the Ministry of Jerusalem and Heritage. This architectural archival database is a platform for

studying architecture and design in modern Jerusalem; it builds on a heritage documentation and digitization project that aims to locate, expose, and digitize official and personal documents pertaining to the city's modern development. The database, on which the platform is based, incorporates eight archival and working collections created under various regimes: Ottoman, British, Jordanian, and Israeli. The project strives to catalog the available documents in three languages in order to expose the material to as many readers as possible and allow various communities and individuals to formulate their own readings of the city's history. The project also endeavors to overcome historical and political conventions; it questions the terminology and categories traditionally used for tagging and cataloging documents in the historiography of Jerusalem. The main challenges encountered by the project are related to technical issues of document storage, disorderly cataloging in the original archives, and obtaining publishing rights.

All in all, the collection of papers published in this special issue presents the state of the art in digital spatial studies and its potential for future interdisciplinary research. Given that Israel has an excellent international standing in both computer sciences and archaeology, we hope that this collection will not only interest those concerned with computer applications and digital humanities in Israel but also the broader scientific community.

References

Aharoni, Y. 1979. *The Land of the Bible: A Historical Geography*. Philadelphia: Westminster.

Bodenhamer, D. J., Corrigan, J., and Harris, T. M. eds. 2010. *The Spatial Humanities: GIS and the Future of Humanities Scholarship*. Bloomington: Indiana University Press.

Conolly, J. and Lane, M. 2006. *Geographical Information Systems in Archaeology*. Cambridge: Cambridge University Press.

Faust, A. and Safrai, Z. 2015. *The Settlement History of Ancient Israel: A Quantitative Analysis*. Ramat Gan: Rennert Center for Jerusalem Studies, Bar-Ilan University (Hebrew).

Faust, A. and Safrai, Z. 2022. Toward a Quantitative History of Ancient Israel: Burials as a Test Case. *Journal of Anthropological Archaeology* 65: 101374. doi:10.1016/j.jaa.2021.101374.

Gregory, I. N. and Geddes, A. 2014. *Toward Spatial Humanities: Historical GIS and Spatial History*. Bloomington: Indiana University Press.

Kallai, Z. 1967. The Tribes of Israel: A Study in the Historical Geography of the Bible. Jerusalem: Bialik Institute (Hebrew).

Silveira, L. E. da. 2014. Geographic Information Systems and Historical Research: An Appraisal. *International Journal of Humanities and Arts Computing* 8: 28–45.

Smith, G. A. 1889. The Historical Geography of the Holy Land, Especially in Relation to the History of Israel and of the Early Church. New York: A. C. Armstrong and Son.

Warf, B. and Arias, S. 2009. *The Spatial Turn: Interdisciplinary Perspectives*. London: Routledge.