



BRILL

## *Footprints: A Digital Approach to (Jewish) Book History*

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### Abstract

This article describes and analyzes the methods of *Footprints: Jewish Books Through Time and Place*, a digital humanities contribution to book history. Footprints collects and aggregates information about the movement of copies of Hebrew books and books of Judaica in other languages printed in the early modern period (roughly corresponding to the hand-press era) and follows evidence of their movement into the twenty-first century. It stores this information in a relational database in which users can run specific queries and delivers the results in a number of visual representations for analysis and interpretation. Footprints undertakes two concurrent and more open-ended aims: (1) the on-going assemblage of a dataset about post-print mobility based on evidence other than the printed text (e.g. marginalia, catalog records, archival letters, other printed texts); and (2) the creation and iterative refining of a scholarly instrument to analyze the dataset through computational methods and modes of representation.

### Keywords

book history – digital humanities – Jewish history – migration

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*Habent sua fata libelli*: these words may have been intended as a general statement about books. So books like *The Divine Comedy*, Spinoza's *Ethics*, and *The Origin of Species* have their fates. A collector, however, interprets this Latin saying differently. For him, not only books but also copies of books have their fates.

WALTER BENJAMIN, "Unpacking my library"<sup>1</sup>

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## 1 Introduction

In the introduction to his foundational study of *Hebrew Incunabula in Public Collections* (1990), Adri K. Offenbergh issued a modest appeal to the power of collaboration in the study of the Hebrew book. Although this erudite Dutch librarian and bibliographer of Judaica was the sole author of this work, Offenbergh closed his introduction with an open call to his readers to take his study not as a last word but rather as an early phase in what he imagined as a collaborative effort in the study of Hebrew books. He did this by supplying a postal address to which visitors to public and private libraries who discovered previously unknown copies of incunables might mail their findings, to be incorporated into the wider scheme of knowledge.<sup>2</sup>

By inviting additions by others, Offenbergh adumbrated a core concept and a key methodological insight of research into the diaspora of Hebrew book copies. Not satisfied with a bibliography of incunable titles alone, he produced a census of copies, offering a sense of the individual features of each individual volume he surveyed. His call also acknowledged that a comprehensive study of the diffusion of material copies in all of their manifold directions would hardly be possible for an individual scholar, even one so accomplished as Offenbergh, and not even for a limited sample set like Hebrew incunabula. Offenbergh thus solicited the concerted activity of multiple researchers across space to create the conditions for a work to emerge that is greater than the sum of its parts.

1 Walter Benjamin, "Unpacking My Library: A Talk about Book Collecting," in *Illuminations*, trans. Harry Zohn, ed. Hannah Arendt (New York: Schocken Books, 1977), 61.

2 Adri K. Offenbergh, *Hebrew Incunabula in Public Collections* (Nieuwkoop: De Graaf, 1990), xxxii.

*Footprints: Jewish Books through Time and Place* adopts the lofty aspirations of Offenberg's call, of which scholars before the 'digital turn' could only dream. *Footprints* is a project dedicated to collecting information about individual copies of books printed between 1450 and 1800. It aims to contribute to a material history of knowledge transmission by collecting and aggregating information about the movement of copies of Jewish books printed in the long early modern period (roughly corresponding to the hand-press era) and follows evidence of their movement into the twenty-first century.<sup>3</sup> It stores this information in a relational database in which users can run specific queries and delivers the results in a number of visual representations for analysis and interpretation. Unlike some projects which pose a delineated number of tightly-defined research questions to a bounded and finite corpus, *Footprints* undertakes two concurrent and more open-ended aims: (1) the ongoing assemblage of a dataset about post-print mobility based on evidence other than the printed text (e.g., marginalia, catalog records, archival letters, other printed texts); and (2) the creation and iterative refining of a scholarly instrument to analyze the dataset through computational methods and modes of representation.

The key component and innovation of the project is the "footprint."<sup>4</sup> We define a footprint as an indication of the material presence of a literary work at a particular time and place. Anyone opening an old book that carries within it a signature of a previous owner has experienced a footprint and may even be familiar with the thrill of encountering users past. A footprint testifies to a past intervention into—or encounter with—the materiality of a text through a social interaction or event. These interactions with the text often appear as owner's inscriptions, book plates, censorship marks, marginal notes, or other post-publication interventions in or beyond the book copy. Material traces such as these constitute evidence of that past social event, be it a moment of sale, inheritance, confiscation, expurgation, or active study.

Attention to the history of dissemination by tracking material joins other scholarly efforts to reconstruct the history of audiences and reception. The unique contribution of *Footprints* comes, however, not only from its meticulous reconstruction of individual book movement, but from the combination

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3 Many hand-press books were still produced in the nineteenth century; however, for pragmatic reasons, we have selected 1800 as our cut-off date (with occasional incidental exceptions). We also follow Lucien Febvre and Henri-Jean Martin's periodization in their classic, *The Coming of the Book: The Impact of Printing, 1450–1800* (London: New Left Books, 1976). For Febvre's brief reflection on the end of the period circa 1800, see the revised edition (New York: Verso, 1990), 11–12.

4 Throughout this article, '*Footprints*' (with initial capital and italicized) refers to the project, and 'footprints' (lower case without italics) are individual data points within the project.

of numerous instances of books in motion. In the aggregate, multiple footprints provide evidence of knowledge transmission and change over time. Moreover, in its reconstruction of often unknown and unacknowledged individuals from the past, the study of ‘footprints’ aims to explore the multifarious exchanges between owners and readers both elite and non-elite, to the middlebrow, to women, and youth. In the process, contributors expand the archive of known historical actors, entering into the historical record the names and activities of people hitherto unknown.<sup>5</sup>

*Footprints* contributes to the history of print by using tools from the digital age. The digital sphere enables us to organize information in ways that fundamentally differ from analog or individual information management. As a consequence, it yields different means or forms of scholarly argumentation and historical narration. But these, too, require new forms of critical literacy and cannot simply be read transparently. They demand both the techniques of the digital programmer and the analytical methods of the humanist to convey new knowledge without replacing the article or the monograph. This article therefore offers an explanation of the potential of this particular digital project to contribute both to Jewish studies and book history more generally. It also gestures towards a critical reading of this project, with attention to the parameters, limitations, and the dynamic and open-ended nature of such a digital project. While we will gesture toward research results, our primary aim here is to explicate the workings of this new research instrument, indicating how use of the digital platform creates distinct opportunities for scholarly inquiry.

## 2 The Scales of Book History: Microhistories and Macrohistories

*Footprints* works to bridge the space between the flows of knowledge on a macroscale and the unique, individual history of book copies on the microscale. We contend that we can learn much about the reach of a work by exploring the dissemination of its various editions in as many copies as possible, in order to

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5 We use the metaphor of archive quite deliberately as it is apparent that early modern (and modern) book users often kept records in their books. We do not mean to suggest that provenance evidence taken from books constitutes a formal state or institutional archive such as were in development in the early modern period. Rather, we highlight the vast amount of information stored—often quite purposefully—in the margins and the flyleaves of printed books. As such, then, we take a somewhat broader view of ‘archive’ than do the impressive and thorough recent studies on institutional archive formation, e.g., Randolph C. Head, *Making Archives in Early Modern Europe: Proof, Information, and Political Record-Keeping, 1400–1700* (Cambridge: Cambridge University Press, 2019).

empirically ground an investigation of its actual market penetration. If every literary work represents a moment in time and space where an idea was conceived and documented, historians of the book know that these moments are instantiated in material form in individual manuscripts, printed editions, and other media whose reception history requires careful reconstruction as well. *Footprints* maps pathways of cultural transmission by beginning its inquiry with the printed book *after* the text is printed, exploring the journeys of the book-as-object by relying on evidence of its uses. Books are bought, sold, shared, read, confiscated, stored, or even discarded. The goal of *Footprints* is to pursue the histories of these individual book copies and to aggregate the data of their respective mobilities into a shared field to enable wider analysis.

Scholarship on the material aspects of printed Hebrew books in particular has tended to focus on the publication history of the edition—paratexts, *mise-en-page*, editing, print variants—rather than post-publication history of individual copies of such editions.<sup>6</sup> Historians of Jewish books and of ‘the’ Jewish book have also generally tended to focus their studies on specific literary works or editions, printing houses, genres, or geographic areas.<sup>7</sup> Others,

6 David Pearson pointed out some thirty years ago that provenance studies had a long and established history especially for manuscripts, but full attention to specific features of printed books through the lens of the ‘history of the book’ was relatively new. See *Provenance Research in Book History*, 1st ed. (London: British Library, 1994), 2–3. In the second and revised edition of the work (Oxford: Bodleian Library and Oak Knoll Press, 2019), Pearson discusses the ways that copy-specific research has developed further and, in a sign of the times, explains how it remains even more relevant in the digital age (44–47).

7 The literature here is vast and we can only offer a sampling here. For broad overviews, see Emile G. L. Schrijver, “Jewish Book Culture Since the Invention of Printing (1469–c.1815),” in *The Cambridge History of Judaism, Volume VII: The Early Modern World, 1500–1815*, eds. Jonathan Karp and Adam Sutcliffe (Cambridge: Cambridge University Press, 2017), 291–315; and Brad Sabin Hill, “Hebrew Printing,” in *Encyclopedia of Hebrew Language and Linguistics* (Leiden: Brill, 2013), 233–262. See also the overview essays in the online *Encyclopedia of Jewish Book Cultures*, vol. 1, eds. Emile Schrijver et al. (Leiden: Brill, 2022), <https://brill.com/view/db/ejbo>, last accessed 7 October 2022. See, for a few representative samples of: (1) studies of specific editions: Yakov Z. Mayer, *Defus rishon: Mahadurat ha-talmud ha-Yerushalmi Venezia 1523 ve-reshit ha-defus ha-Yvri* [Editio Princeps: The 1523 Venice Edition of the Palestinian Talmud and the Beginning of Hebrew Printing] (Jerusalem: Magnes Press, 2022); Noam Sienna, “Rabbis with Inky Fingers: The Making of an 18th-century Hebrew Book between Amsterdam and North Africa,” *Studia Rosenthaliana* 46 (2020): 155–189; (2) studies of printers and printing houses, ranging from comprehensive enumerative bibliography to microstudies of specific activities or key moments in the lives of printers: Abraham Meir Habermann, *Ha-madpis Daniel Bombergi u-reshimat sifre bet defuso* (Safed: Museum of the Printing Arts, 1978); Giuliano Tamani (ed.), *L'attività editoriale di Gershom Soncino, 1502–1527: Atti del convegno (Soncino, 17 Settembre 1995)* (Soncino: Edizioni dei Soncino, 1997); Bruce Nielson, “Daniel von Bombergen, a Bookman of Two Worlds,” in *The Hebrew Book in Early Modern*

sketching larger trends based on a birds-eye view of what has been printed, have asked what print does in a specific scholarly, educational, intellectual milieu. Some have grappled impressionistically with the full impact of print, but an empirical testing ground for their insights would be a welcome substantiation of their claims.<sup>8</sup>

*Footprints'* central contribution is its use of digital methods to facilitate data aggregation and visualization for exploring the history of the book. *Footprints* adds to the study of the materiality and individuality of each copy after leaving the print shop, offering what might be called a 'microhistory' of a particular book copy: sales, transfers of ownership over time, readership and other encounters with the book, expurgation, and even destruction. It does this by drawing upon a variety of sources as evidence, from inscription in the material

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*Italy*, eds. Joseph R. Hacker and Adam Shear (Philadelphia: University of Pennsylvania Press, 2011), 56–76; Magda Teter and Edward Fram, "Apostasy, Fraud, and the Beginnings of Hebrew Printing in Cracow," *AJS Review* 30 (2006): 31–66; (3) studies on the range of printing in specific geographic areas: Hacker and Shear (eds.), *The Hebrew Book in Early Modern Italy*; Abraham Yaari, *Ha-defus ha-'Ivri be-Kushta* (Jerusalem: Magnes Press, 1967); Joseph R. Hacker, "Authors, Readers, and Printers of Sixteenth-century Hebrew Books in the Ottoman Empire," in *Perspectives on the Hebraic Book*, ed. Peggy K. Pearlstein (Washington, DC: Library of Congress, 2012), 17–63; Shlomo Berger, "Books for the Masses: The Amsterdam Yiddish Book Industry, 1650–1800," *European Judaism* 442 (2009): 24–33; Theodor Dunkelgrün (ed.), *The Jewish Bookshop of the World: Aspects of Print and Manuscript Culture in Early Modern Amsterdam*, *Studia Rosenthaliana*, 46(1–2) (2020), special issue; (4) studies on collections large and small: Shifra Z. Baruchson, "Jewish Libraries: Culture and Reading Interests in 16th Century Italy," *Library History* 10 (1994): 19–26; Gianfranco Miletto, "Judah Moscato: Biographical Data and Writings," in *Rabbi Judah Moscato and the Jewish Intellectual World of Mantua in the 16th–17th Centuries*, eds. Giuseppe Veltri and Gianfranco Miletto (Leiden: Brill, 2012), 3–13; Joshua Teplitsky, *Prince of the Press: How One Collector Built History's Most Enduring and Remarkable Jewish Library* (New Haven, CT: Yale University Press, 2019); (5) studies on Jewish books in various languages: Jean Baumgarten, *Introduction to Old Yiddish Literature* (Oxford: Oxford University Press, 2005); Matthias B. Lehmann, *Ladino Rabbinic Literature and Ottoman Sephardic Culture* (Bloomington: Indiana University Press, 2005).

- 8 Thus David Ruderman identified a "knowledge explosion," facilitated by the introduction of print, as a central characteristic of the early modern Jewish experience. See *Early Modern Jewry: A New Cultural History* (Princeton, NJ: Princeton University Press, 2011), ch. 3: "Knowledge Explosion," 99–132. See also Zeev Gries, *Ha-sefer ke-sokhen tarbut ba-shanim 1700–1900* [The Book as An Agent of Culture in the Years 1700–1900] (Tel Aviv: Ha-kibbutz ha-me'uhad, 2002); English trans., *The Book in the Jewish World, 1700–1900* (Portland, OR: Littman Library of Jewish Civilization, 2007). Other approaches to assessment of the cultural impact of print have tended toward reception histories or microhistories of particular early modern literary works and their impact: see, e.g., Joseph Davis, "The Reception of the Shulhan 'Arukh and the Formation of Ashkenazic Jewish Identity," *AJS Review* 26 (2002): 251–276; Marjorie Lehman, *The En Yaaqov: Jacob Ibn Habib's Search for Faith in the Talmudic Corpus* (Detroit, MI: Wayne State University Press, 2012); Adam Shear, *The Kuzari and the Shaping of Jewish Identity, 167–1900* (Cambridge: Cambridge University Press, 2008).

copy itself to catalog records to references in private correspondences referring to copies in passing. We then aggregate these microhistories of individual book copies to enable macrohistorical analysis. In this aggregation of data, *Footprints* joins other projects that have used digital methods to reconstruct the availability of texts in particular contexts and the uses of particular book copies by individual readers.<sup>9</sup>

We begin by focusing on each printing of a literary work as an initial material instantiation of the work. Each edition or imprint then can be associated with the multiple copies produced during the print run. While we cannot identify or locate every book copy of every imprint, we use historical evidence that attests to the presence of the book copy as a material artifact in a particular moment in place and time (a ‘footprint’). By categorizing the output of each literary work into its editions, and then collecting information about all of the available information about the copies of each edition, *Footprints* offers answers about the reach of specific editions and the work writ large.

### 3 Organizing the Data: Relational Taxonomy

How does *Footprints* provide this bridge between the individual book copy and the larger aggregation of data? Like every database, *Footprints* relies upon computational, quantitative methods, and thus requires well-defined parameters. In a relational database, the connections between imprints, individual book copies and their ‘footprints’ require a specific ontology. As such, we developed our taxonomy loosely based on a standard for library cataloging, the Functional

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9 For a sample of other early modern projects, see *Material Evidence in Incunabula* (MEI: <https://data.cerl.org/mei>); *Annotated Books Online: A Digital Archive of Early Modern Annotated Books* (ABO; <https://www.annotatedbooksonline.com/>); *The Archaeology of Reading* (AOR; <https://archaeologyofreading.org/>). See especially MEDIATE [Measuring Enlightenment: Disseminating Ideas, Authors and Texts in Europe (1665–1830)] (<https://mediate18.nl/>). MEDIATE seeks to reconstruct the broad sweep of what books were owned by Dutch, British, and French readers in the long eighteenth century. See Alicia C. Montoya, “Enlightenment? What Enlightenment? Reflections on Half a Million Books (British, French, and Dutch Private Libraries, 1665–1830),” *Eighteenth-Century Studies* 54(4) (2021): 909–934; and idem, “Middlebrow, Religion, and the European Enlightenment: A New Bibliometric Project, MEDIATE (1665–1820),” *French History and Civilization* 7 (2017): 66–79. Linked data amongst all these projects remains as the future digital *ne plus ultra*, but *Footprints* and MEI have collaborated and shared overlapping data; *Footprints* and MEDIATE are in conversation on sharing data and reconciling different data models.

Requirements for Bibliographic Records (FRBR) hierarchy.<sup>10</sup> FRBR's structure represents a hierarchy from the abstract literary work to a concrete individual item as follows: Work→Expression→Manifestation→Item. The *Footprints* taxonomy modifies FRBR to meet the needs of its database design: Literary Work→Imprint→Copy→Footprint (see Fig. 1). 'Literary work' is the most difficult of our terms to define as it intersects with the multiple meanings of the word 'book.' In this case, 'work' is the top-level abstraction of text with content, such as Miguel de Cervantes's *Don Quixote* or Moses Maimonides' *Guide of the Perplexed*, without reference to particular translation, edition, manuscript or print, or a particular book-copy.<sup>11</sup> 'Imprint' here refers to a print-run of a particular edition, eliding distinctions between edition, state, and impression that are used in descriptive bibliography. This simplification is necessary for the purpose of relational database design and an acceptable compromise for a research project primarily concerned with the history of the material text *after* it leaves the printshop.<sup>12</sup> Imprints result in multiple 'copies.' The final, and most important unit is the 'footprint,' which describes the person/place/date of an encounter with a book (see Fig. 2).

To translate this taxonomy into a concrete set of examples, let us take the case of Isaac ben Moses Arama (c.1420–1494) and his collection of homilies on the Pentateuch known as *Aqedat Yiṣḥaq* [Binding of Isaac]). *Aqedat Yiṣḥaq* by Arama constitutes a *literary work*. It was composed in the fifteenth

10 For full details on FRBR, see the International Federation of Library Associations and Institutions's *Functional Requirements for Bibliographic Records: Final Report* (1997, rev. 2009), [https://www.ifla.org/files/assets/cataloguing/frbr/frbr\\_2008.pdf](https://www.ifla.org/files/assets/cataloguing/frbr/frbr_2008.pdf), last accessed 22 February 2022.

11 This understanding of 'literary work' as the abstract ideal-book owes much to Joseph A. Dane's emphasis on the difference between the abstraction and the material book-copy. See Dane, *The Myth of Print Culture: Essays on Evidence, Textuality, and Bibliographical Method* (Toronto: University of Toronto Press, 2003), esp. ch. 3: "What Is a Book? Classification and Representation of Early Books," 57–87.

12 Our taxonomy merges 'work' and 'expression' as 'literary work.' In FRBR, 'Expression' allows for a precise delineation of different versions of a 'work'—e.g., the different versions of the collection of kabbalistic midrash known as the *Zohar* represented by the Mantua and Cremona editions of that work. On these two editions and the difficulties they pose for conceptualizing the *Zohar* as a discrete 'work,' see Daniel Abrams, *Kabbalistic Manuscripts and Textual Theory: Methodologies of Textual Scholarship and Editorial Practice in the Study of Jewish Mysticism* (Jerusalem: Magnes Press, 2013) and Boaz Huss, *The Zohar: Reception and Impact*, trans. by Yudith Nave (Liverpool: The Littman Library of Jewish Civilization, 2016). As translations of a work constitute additional expressions of that work, our taxonomy would treat editions of translations in the same way as editions of the original.



FRBR	Footprints
Work	Literary Work
Expression	
Manifestation	Imprint
Item	Copy
	Footprint

FIGURE 1 FRBR vs. *Footprints*

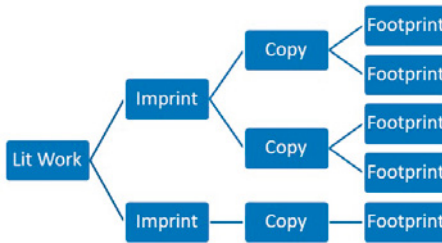


FIGURE 2 Abstract representation of the taxonomy

century and copied in manuscript. Beginning in 1522 in Salonika, the work was printed multiple times during the sixteenth century. Each of these printings, in our scheme, is considered an *imprint*.<sup>13</sup> The 1522 printing in Salonika represents one instantiation of the literary work. Each successive printing is another imprint of the same literary work. We can assume each printed edition resulted in some 300–500 copies.<sup>14</sup> One of the copies of the Salonika imprint

13 In order to relate all of the imprints and copies to each other as material representations of the same literary work, we do not treat changes or additions to a subsequent edition as constituting a new literary work. For example, the Venice 1573 edition of the *Aqedat Yiṣḥaq* also includes Arama’s commentaries on the Five Megillot. This might be considered a new work and thus full bibliographical and literary discussion of these editions would require qualitative description that explained the differences. However, in order to gain the advantages of the database structure, we treat it as one more example of the same literary work.

14 Schrijver, “Jewish Book Culture,” 300–301. Such a figure is indeed very conservative and may only be true for some, but not all, Hebrew books printed in the fifteenth and sixteenth centuries. A figure of 300 copies for Hebrew incunabula comes from Michael Pollak, “The Daily Performance of a Printing Press in 1476: Evidence from a Hebrew Incunable,” *Gutenberg Jahrbuch* (1974): 66–76; and Avraham Rosenthal’s response in “Some Remarks on ‘The Daily Performance of a Printing Press in 1476,’” *Gutenberg Jahrbuch* 15 (1979): 39–50. See also A. M. Habermann, *Toledot ha-sefer ha-’Ivri* (Jerusalem: Rubin Mass, 1945), 39–40. Brian Richardson points to a similar figure for Latin books in the fifteenth century but provides evidence that the number of copies was closer to 1000 by the sixteenth century. See Richardson, *Printers, Writers, and Readers in Renaissance Italy* (Cambridge:

is now held at the Library of the Katz Center for Advanced Judaic Studies at the University of Pennsylvania. This copy preserves nine signatures and stamps showing (some of) its journey.<sup>15</sup> Each of these signatures and stamps represent a distinct ‘footprint.’ The first four represent moments of encounter between church censors and the book copy. More specifically, the first marking belongs to the censor Luigi da Bologna’s review in 1598 in Modena, telling us that the copy was expurgated 76 years after its printing, hundreds of miles from Salonika. This is followed by signatures of other censors—Camillo Jagel in Modena in 1613; Giovanni Domenico Caretto in 1628; and then Gerolamo da Durazzano in 1640 (see Fig. 3). Although the copy was not marked up or annotated for nearly three centuries after that point, we next see that Mayer Sulzberger donated this copy to Dropsie College at its inception in 1907.<sup>16</sup> In 1986 we see further stages in this copy’s story, as it became part of the collection of the Annenberg Research Institute, the successor to Dropsie College; and then, in 1993, the Center for Judaic Studies as the Annenberg Institute merged with the University of Pennsylvania (now the Katz Center for Advanced Judaic Studies at the University of Pennsylvania).<sup>17</sup> Its presence there has created the circumstances for this very reconstruction. In addition to the library stamps, the evidence for these footprints emerges in archival documents that give the institutional history of the Dropsie-Annenberg-Penn collection, not to mention additional biographical information about individuals like Sulzberger who were responsible for donating the copy to Dropsie.

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Cambridge University Press, 1999), 21. There is evidence to suggest that some 300–500 copies would be standard for sixteenth-century philosophical or scholarly works but that a halakhic work in the same period might be printed in as many as 800 copies, with the number of copies for liturgical works or Bibles in the thousands. See Shear, *Kuzari*, 51, and the references cited there: Shifra Baruchson, “Money and Culture: Financing Sources and Methods in the Hebrew Printing Shops in Cinquecento Italy,” *La Bibliofilia* 92 (1990): 23–39; Pier Cesare Ioly Zorattini, “Il ‘Mifaloth Elohim’ di Isaac Abravanel e il Sant’Uffizio di Venezia,” *Italia* 1 (1976): 54–69.

15 See <https://footprints.ctl.columbia.edu/writtenwork/67/1945/2674/>.

16 For more on Sulzberger’s important role in shaping American Judaica collections, see Adolph S. Oko, “Jewish Book Collections in the United States,” *The American Jewish Year Book* 45 (1943–1944): 67–96.

17 Minor name changes of the same institution (Dropsie College to Dropsie University; or Center for Judaic Studies to Center for Advanced Judaic Studies to Katz Center for Advanced Judaic Studies) are not marked. However, when a library or holding institution undergoes a significant administrative transformation (Dropsie to Annenberg; Annenberg to a center of the University of Pennsylvania), this is marked as a footprint as it indicates a new encounter of book and owner.

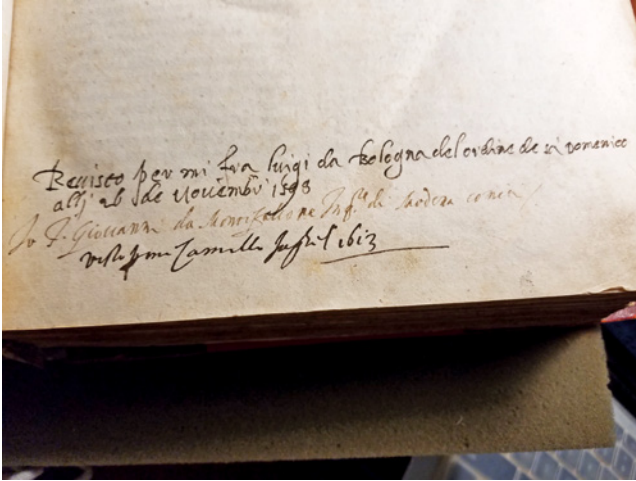


FIGURE 3 Courtesy of the Library at the Herbert D. Katz Center for Advanced Judaic Studies, Kislak Center for Special Collections, Rare Books and Manuscripts, University of Pennsylvania

This taxonomy undergirds *Footprints* as an enterprise. It captures the relationship between the individual book copy as a unique item as well as its relationship to a larger set of categories, be they the cluster of footprints in the individual migration of a particular book copy, or as the material for examining and mapping the larger transmission of particular cultural trends across time and place.

Each element of the taxonomy has a unique identifier and is linked to other data points, forming a rich architecture of data linkage. Written work and author information are connected to Library of Congress Authorities files and VIAF, the Virtual International Authority File.<sup>18</sup> (Names of other actors such as book owners, sellers, expurgators, publishers, etc. are also linked to VIAF where possible.) Imprints are linked to the Bibliography of the Hebrew Book at the National Library of Israel (BHB) and other union catalog projects. Place names of imprints and footprints are connected to GeoNames.<sup>19</sup> Every footprint for

18 While we recommend contributors use a modified Library of Congress standard for transliteration, the existence of the unique identifier and its linked data alleviates potential errors and hazards implicit in the process of transliteration as well. Additionally, a collaboration with DICTA has enabled a 'fuzzy search' functionality, yielding search results encompassing variant spellings in Latin characters.

19 See <https://www.geonames.org/>.

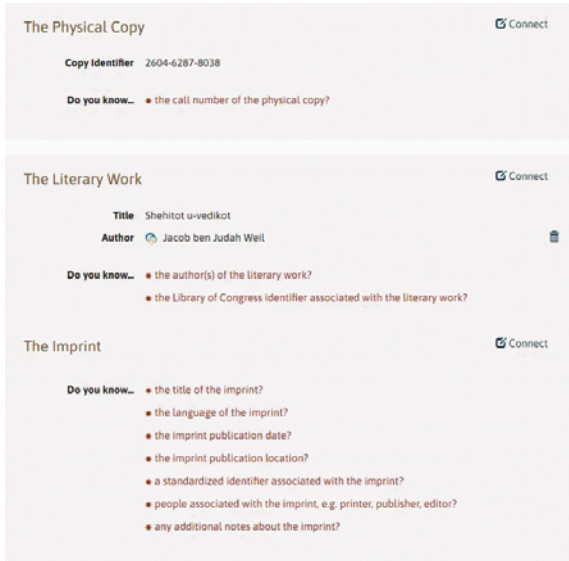


FIGURE 4 Image of Footprint record with prompts for Literary Work/Imprint information

a book copy is linked to all other footprints for that same copy via a physical copy identifier and if known, by a shared call number (shelf mark) for the item (Fig. 4).<sup>20</sup>

At the time of this writing, *Footprints* records 63 footprints for the literary work titled *Aqedat Yiṣḥaq* (whose work identifier in *Footprints* is '67'). Those 63 footprints aid in reconstructing the movement of 21 copies (each indicated by a call number in its current location) from four different imprints (each with a unique BHB number).<sup>21</sup> These footprints have entered our dataset through the examination of owner's signatures,<sup>22</sup> bookplates,<sup>23</sup> and institutional records,<sup>24</sup> as well as auction catalogs,<sup>25</sup> an estate inventory,<sup>26</sup> and other documentary sources. The movement of 21 copies of four different imprints of the literary

20 If there is no shelf mark because present whereabouts of the copy are not known, we use 'Historical Copy' as the call number.

21 Salonika, 1522—identifier #1945; Venice, 1456–7—identifier #6833; Venice 1565—identifier #1083; and Venice, 1572–3—identifier #533.

22 See <https://footprints.ctl.columbia.edu/footprint/20198>.

23 See <https://footprints.ctl.columbia.edu/footprint/20205>.

24 See <https://footprints.ctl.columbia.edu/footprint/5049>.

25 See <https://footprints.ctl.columbia.edu/footprint/20203>.

26 See <https://footprints.ctl.columbia.edu/footprint/102>.

work, *Aqedat Yiṣḥaq*, tells us about the reach (across the globe) of Isaac Arama's fifteenth-century opus as it was encountered by censors, readers, and owners during the five centuries that followed.

All historical research grapples with the limitations of available evidence. In the case of books, historians must contend with loss and destruction, ranging from the cataclysmic to the quotidian. Jewish book historians also must be attuned to large-scale shifts and dramatic upheavals in Jewish life, most obviously the Holocaust, but also expulsions, migrations, book burnings, and confiscations, as well as wear-and-tear, neglect, and the ultimate disposal of books.<sup>27</sup> Indeed, an acknowledgement of loss is an integral part of the database's program. Our project examines not only *extant* books for evidence of prior ownership, but also enlists information from other sources for evidence of past ownership of books that have been destroyed or whose present whereabouts are unknown.<sup>28</sup> We call these entries 'historical copies' to distinguish them from extant surviving material copies and to indicate that while the object may not be known in the present, we can still reconstruct its place in the past even without knowing its current whereabouts. We accomplish this through recourse to documentary sources (rather than material artifacts) such as booklists or estate inventories, which attest to the presence of book copies even though the present whereabouts of the particular copies are unknown. Attention paid to the 'historical copy' offers an even more robust sampling of the past than if we relied on recording information from physical copies alone.

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27 For a sampling of case studies on the loss of books in various modes and in differing circumstances, see Angela Nuovo, "The Creation and Dispersal of the Library of Gian Vincenzo Pinelli," in *Books on the Move: Tracking Copies Through Collections and the Book Trade*, eds. G. Mandelbrote et al. (London: British Library and Oak Knoll Press, 2007), 39–68; Richard Ovenden, *Burning the Books: A History of the Deliberate Destruction of Knowledge* (Cambridge, MA: Harvard University Press, 2020); Jonathan Rose (ed.), *The Holocaust and the Book: Destruction and Preservation* (Amherst, MA: University of Massachusetts Press, 2001); Elisabeth Gallas, *A Mortuary of Books: The Rescue of Jewish Culture after the Holocaust*, trans. by Alex Skinner (New York: New York University Press, 2019). Edward Wilson-Lee uses an inventory of books owned by Hernando Colón that were lost at sea to title his study, *The Catalogue of Shipwrecked Books: Christopher Columbus, His Son, and the Quest to Build the World's Greatest Library* (New York: Scribner, 2019).

28 For an example of a footprint that records the loss of a book in a fire, see <https://footprints.cfl.columbia.edu/footprint/11530/>.

#### 4 Organizing the Data: Criteria for Inclusion

Just as a taxonomy is needed to craft a relational database, so too are clear criteria for inclusion needed to craft a data set that can be analyzed. *Footprints* considers movement of books, printed prior to 1800, in Hebrew or other languages that use Hebrew characters or treat Jewish topics in other languages. *Footprints* maintains an exclusive focus on print matter predicated on an understanding that an aggregate of individual copies reflect something about the work. Manuscripts, which defy such taxonomies, are not currently part of the scope of this project, though they would certainly shed further important light on the dissemination of knowledge.<sup>29</sup> Since we are interested in gauging the impact of literary works through assessing the diffusion of editions, we are studying a process that is different from manuscript diffusion where each copy constitutes an 'edition' of its own. Moreover, the state of the field until recently has left the individual artifactual nature of each book copy underdeveloped in the study of printed books compared to its central role in manuscript studies. This is despite the fact that the sheer numeric preponderance of print matter dwarfs that of manuscripts.<sup>30</sup> The nature of print technology means that many more printed book copies were in circulation than manuscript books during the early modern period.

Even as it distinguishes categorically between manuscripts and books, the methodology of *Footprints* suggests that students of print still have much to learn from the highly individuated study of copies known so well to students of manuscripts.<sup>31</sup> Although manuscripts qua manuscripts do not register as objects tracked by the database, handwriting features as evidence for the movement of printed books and its presence is palpable, in inscriptions in

29 The coexistence of print and manuscript is, by now, well established in the scholarship on the history of the book. For an overview, see David McKitterick, *Print, Manuscript, and the Search for Order, 1450–1800* (Cambridge: Cambridge University Press, 2005).

30 A survey of the  $\kappa$ TIV/IMHM (Institute for Microfilmed Hebrew Manuscripts) catalog of Hebrew manuscripts indicates approximately 184,000 extant Hebrew manuscripts created between 1500 and 1800. Many of these are partial copies or fragments. Even a conservative estimate (detailed above) of 650,000 printed book copies (of Hebrew books printed up to 1800) now extant suggests a need to focus on this large corpus for big data purposes.

31 Provenance has already been significant in the study of manuscripts and many resources exist for the study of manuscript 'footprints,' notably the Schoenberg Database of Manuscripts, <https://sdbm.library.upenn.edu/> and the International Collection of Digitized Hebrew Manuscripts ( $\kappa$ TIV), <https://www.nli.org.il/he/discover/manuscripts/hebrew-manuscripts>. There is a rich potential for a linkage of such discrete projects for a fuller reconstruction of the history of libraries.

books, in booklists, and in manuscripts copied from printed books.<sup>32</sup> In addition, by specifying an interest in books printed before 1800 without reference to ‘earliest’ or ‘most valuable’ or ‘most beautiful,’ *Footprints* emphasizes the use of all manner of books and does not privilege the choices or aesthetic preferences of wealthy or later collectors.<sup>33</sup>

Just as we have excluded manuscript books, we also intentionally limit the database to books on Judaic topics or in Judaic languages.<sup>34</sup> The database as constructed is not aimed at the history of what Jews knew (which could include their reading of a novel in Italian or a mathematics textbook in German) but the history of what was known *about* Jews and Judaism, regardless of the identity of the readers and book owners (who might not themselves be Jewish). This project is designed to explore the scope of Judaic information available to a potential reader, but not necessarily the complete relationship of the objects of Judaic information to all other bodies of knowledge. We recognize that this is only part of the portrait and that lacunae remain. Most collectors (Jewish or not) of books would not be so tightly focused in their collecting as to exclude books that do not fit a modern definition of Judaica and Hebraica. For example, collections belonging to early modern Jews and Christians reveal the mingling of copies of obvious Judaic relevance with works of science, theology, grammar, and history in Latin or other languages.<sup>35</sup> *Footprints* is focused not on the full extent of these collections, but rather on the book copies printed in

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32 Indeed, Peter Stallybrass has argued that one of the most transformative aspects of print was the stimulation of more writing and more manuscripts. See “Printing and the Manuscript Revolution,” in *Explorations in Communication and History*, ed. Bobbie Zelizer (London: Routledge, 2008), 111–118.

33 See Montoya, “Enlightenment? What Enlightenment?”

34 On the problems that inhere and persist in categorizing a book as ‘Jewish,’ see Adam Shear, “Introduction to AJS Review Symposium: The Jewish Book: Views and Questions,” *AJS Review* 34(2) (2010): 353–357; and Yaacob Dweck, “What Is a Jewish Book?” in *ibid.*, 367–375. Of note, a distinction between ‘Jewish’ and ‘Christian’ books was made by at least one sixteenth-century Venetian Jew. See A. Shear, “Intercultural Contacts Projected in the Paratexts: Hebrew Books and Christian Readers,” *Archivio italiano per la storia della pieta* 25 (2012): 88–89.

35 See, e.g., Shlomo Berger, “Codices Gentium: Rabbi Isaac Aboab’s Collection of Classical Literature,” *Studia Rosenthaliana* 29(1) (1995): 5–13; Federica Francesconi, *Invisible Enlighteners: The Jewish Merchants of Modena, from the Renaissance to the Emancipation* (Philadelphia: University of Pennsylvania Press, 2021), esp. 64–89; Francesca Bregoli, “Jewish Scholarship, Science, and the Republic of Letters: Joseph Attias in Eighteenth-Century Livorno,” *Aleph: Historical Studies in Science & Judaism* 7 (2007): 97–181; Joanna Weinberg, “Corpus Christi College’s ‘Trilingual Library’: A Historical Assessment,” *History of Universities* 32 (1–2) (2019): 128–142. See also the works cited in n. 7 above.

Jewish languages and books of Jewish content printed in other languages, such as a copy of Josephus printed in Latin.

And yet, the delineation between ‘Jewish’ and ‘non-Jewish’ is not necessarily simple or natural. Rather, these are themselves historically constructed categories. In some cases, translating a work into a Jewish language ‘judaizes’ a work, but our criteria of including all works in Hebrew characters does not pre-judge the question but offers opportunities for analysis.<sup>36</sup> The fact that Azriel ben Joseph Ashkenazi Gunzenhauser was willing to invest in printing in 1492 a Hebrew translation of Avicenna’s medical textbook, the *Canon*, tells that the book was produced for a specifically Jewish audience. Moreover, a user annotating the Hebrew translation of Avicenna with marginal notes in Latin as well as Hebrew takes us one step further in understanding primary and secondary languages of study.<sup>37</sup> We cannot place these examples against an objective standard that definitely tells us that the Hebrew *Kanon* was a Jewish book. However, it was, without a doubt, a Hebrew book.

## 5 Reading the Data: Horizons of Possibility

*Footprints*’ large-scale aggregation of data is designed to reconstruct the ranges of reading possibilities available to people in the past. The taxonomy outlined in the previous section turns a combination of incidental pieces of evidence into ‘big data,’ which enables users to ask questions about the movement of knowledge over time and across space. While some researchers will use the data to drill down to the individuated experiences, others will use the database to map the broad patterns of distribution and circulation of knowledge as contained in literary works, specific imprints, and individuated book copies. The sum of the parts in the database represents rich opportunities for reconstructing patterns of reading and the dissemination of knowledge, and to explore those questions as they relate to particular moments or periods of time, and specific locations, regions, or cultural milieux.

Thus, users with different research agendas may orient themselves towards a variety of questions and access the data in a variety of ways. These examples can be queried in the *Footprints* search engine, yielding results in a list format

36 See Iris Idelson-Shein, “Rabbis of the (Scientific) Revolution: Revealing the Hidden Corpus of Early Modern Translations Produced by Jewish Religious Thinkers,” *American Historical Review* 126 (2021): 54–81.

37 *Kanon* with Hebrew and Latin annotation: <https://footprints.cml.columbia.edu/footprint/14943>.



that can then be explored in more detail. Some types of queries include (but are far from limited to):

- Reconstructing a historical library: The ownership of books by a single individual or institution (even though those books may have been since scattered). For example, one might reconstruct the collection of Moses Gaster (1856–1939), now dispersed across dozens of libraries.<sup>38</sup>
- The dissemination and impact of a specific author, e.g., the trajectory of books authored by Joseph Karo.
- Assessing the potential impact of a literary work (or a group of literary works) in a place and time: The assemblage of books from disparate locations in a particular place, e.g., copies of works of Hebrew grammar that came to centers of Christian learning between 1500 and 1700.
- Measuring the market penetration and impact of a particular location of printing, e.g., where books printed in Mantua in the late sixteenth century could be found in the seventeenth century.
- The use and ownership of books by the ‘non-elite,’ e.g., footprints associated with women owners in the seventeenth century.

These specific queries represent one facet of *Footprints* as a tool for research. Perhaps more significantly, the aggregation of data offers the possibility of reconstructing the ‘potential literary diet’ or intellectual milieu of a place in time. For example, a researcher wishing to uncover what a reader in seventeenth-century Kraków *might* have read can begin by determining elements of what that reader may have been able to *access*. Here, collections and individual copies combine to establish a composite portrait of *available* bibliography. To have a book is not necessarily to have read it, and to read a book one does not necessarily need to own it.<sup>39</sup> Yet the presence of unread books means that those books were available to *others* to read. Readers share books, lose books, and discard and sell books after use. Because of this individual variation in use of books, *Footprints* gives us a composite portrait rather than making an assumption that every book was read and every idea absorbed. The

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38 On the dispersal of Gaster’s printed books, see the introduction to idem, “The Story of My Library,” *The Electronic British Library Journal* (1995) at <https://www.bl.uk/ebj/1995/articles/article2.html>. While an ‘analog’ format has been used to reconstruct lost or dispersed libraries, we argue that the digital medium and the *Footprints* taxonomy not only makes this easier to accomplish but also offers the user many more possibilities of understanding the linkages of Gaster’s books to the works of other owners. It also enables comparison of the trajectory of Gaster’s books to those of other imprints and copies.

39 As Pearson points out, “the mere fact of ownership of a book, whether annotated or not, provides evidence of past interest” (*Provenance Research in Book History*, 2nd ed.), 4.

co-incident in time and place of books between owners who may not have read them and readers who may not have owned them allows researchers an important space in which to disentangle the act of reading from other types of encounters with the book. While surveys of the rise and fall of different print centers and the quantity and the nature of their imprints have given us a rich portrait of what was printed,<sup>40</sup> *Footprints* sketches the spread of those editions from particular cities and printshops across the wider world of Jewish letters. This exploration of ‘market penetration’ tests the assumptions of previous historians who view printed editions of given texts as an index of popularity or the ‘spread’ of the ideas in the text.

A few other aspects of the ‘footprint’ element of the taxonomy are worth noting. While some provenance projects list ownership as a time span, footprints here are instances in time, not processes. Moreover, footprints represent encounters with the book beyond sales and ownership. The date of the footprint is a moment when an event takes place—a transfer of ownership; a moment when a censor examines a text for expurgation; a moment when a book is recorded in an inventory. In our data model, for example, a range of dates associated with the name of an owner represent not a *period* of ownership but a range of time in which the transfer of ownership is interpreted as having taken place.

Thus in the example of the copy of *‘Aqedat Yiṣḥaq* currently at the University of Pennsylvania (discussed above), we do not have information about the book between the evidence from 1640 and that of 1907. We cannot, at this stage, ascertain if there were more peregrinations in those intervening centuries, or if the book lay still in a library or a home. We do not yet know, for example, which readers traveled to visit it in Modena. But because *Footprints* is an ever-growing database that thrives on collaborative additions, we anticipate that still more evidence may surface in the future shedding further light on the story of this copy. While those gaps and silences are unsettling for individual book copies, the scale of the database reduces the impact of the silences on the larger story. In the aggregate, the gaps recede and the larger picture comes into sharper relief.

40 Such data is most accessible through the *Bibliography of the Hebrew Book*, accessible via the National Library of Israel’s website (<https://www.nli.org.il/en/research-and-teach/catalogs#hebrew>); and the combined bibliographic data in Yeshayahu Vinograd and Moshe Rosenfeld’s *Oṣar ha-sefer ha-‘Ivri: reshimat ha-sefarim she-nidpesu be-ot ‘Ivri me-reshit ha-defus ha-‘Ivri bi-shenat 229 (1469) ‘ad shenat 623 (1863)* (Jerusalem: Ha-Makhon le-bibliyografiyah memuḥshevet, 1993–1995), which includes the material in the earlier work of Ḥayyim Dov Friedberg, *Bet ‘eked sefarim*, 2nd edition (Tel Aviv: Ha-Mimkhar ha-rashi: M. A. Bar-yoda, 1951–1956).

## 6 Building a Dataset: Flying the Plane while Building it

The focus of *Footprints* on the ongoing creation of a dataset makes it stand out in the existing landscape of digital scholarship. Many Digital Humanities projects use computational methods to engage with the textual content of literary works. Most such projects work through methods that analyze digitized texts from corpora that are defined and assembled prior to the start of the analysis.<sup>41</sup> Our approach, on the other hand, starts from the book as artifact and enlists computational methods to reconstruct circumstantial information about the context in which it was transmitted. The *Footprints* project is built on various forms of provenance data rather than digitized texts and images.<sup>42</sup> It thus requires the construction of a data set *de novo*, achieved in and through a digital medium by the ongoing concerted and collective activities of a network of contributors into a central, remote, and virtual repository.<sup>43</sup>

41 These methods allow users to search for the recurrence of literary formulations of texts with OCR scanning which enables the user to assess the relationship between different words and to sketch out the changing meaning of language as mobilized in a genre, corpus, or period. For an overview of this kind of work and some skepticism about whether what is often called ‘distant reading’ is entirely new in the digital age, see Ted Underwood, “A Genealogy of Distant Reading,” *Digital Humanities Quarterly* 11(2) (2007), <http://digitalhumanities.org/dhq/vol/11/2/000317/000317.html>.

42 The multi-directionality of a digital platform is what enables that instrument to operate. *Footprints* joins aspects of union catalogs and searchable databases with the publication of research findings. Where it differs from some projects is in its interest in generating a new archive built on data rather than digitized texts and images. The investment of public and private institutions and funders in making more material from the past accessible is a substantive contribution to scholarship. This has led to a proliferation of websites that are now essential to the research process and the publication of research in the humanities and allied social sciences. The former include digitization of texts; the use of optical character recognition (OCR) to create searchable full-text electronic editions; and the move to online union catalogs of primary sources. The latter includes, for example, curated online exhibitions and online supplements of published articles or monographs providing primary sources, visual evidence, or quantitative data sets. For an analysis of how digitized material has impacted the research process, see Lara Putnam, “The Transnational and the Text-Searchable: Digitized Sources and the Shadows They Cast,” *American Historical Review* 121(2) (2016): 377–402.

43 For example, impressive projects like *Six Degrees of Francis Bacon* (<http://www.sixdegreesoffrancisbacon.com/>) and the *French Book Trade in Enlightenment Europe* (FBTEE) Project (<https://frenchbooktrade.wordpress.com/>) began with existing datasets, which they then enhanced. Of note, FBTEE plans to add more to its dataset. See James Smith Allen’s review of Mark Curran, *The French Book Trade in Enlightenment Europe 1: Selling Enlightenment* and Simon Burrows, *The French Book Trade in Enlightenment Europe II: Enlightenment Bestsellers*, *American Historical Review* 125(2) (2020): 730–732.

The digital medium is an essential, rather than incidental, component of this project. It serves as a shared virtual space that is a repository of micro-research. In the absence of a single corpus or bibliographic authority, *Footprints* relies on the contributions of a far-flung network of scholars who deposit their findings in a central repository, in asynchronous timing. It offers something we call ‘collaboration without collaboration,’ namely, the possibility of contributing, sharing, editing, and revising information even without direct contact. Contributors actively reconstruct the circumstances of a book’s movement in time and place, deciphering handwriting, establishing biographical information, and offering conjectures often based upon scant historical information. The deciphering activity of one scholar may be complemented by the incidental identification activity of another. These products of careful humanistic reconstruction by individual scholars achieve new meaning when aggregated. The shared participation in the virtual space of an ever-growing network of contributors with varying levels of commitment and involvement has led to a *Footprints* community which blends traditional distinctions between funded investigators, volunteers participating in trusted crowd-sourcing, and institutional collaborators.<sup>44</sup>

At this point, some researchers (including authors of this article) have been identifying and entering data into *Footprints* as part of research on other projects and using the taxonomies and tools of the project to structure research questions. This approach complements two other and perhaps more common types of ingesting data—importing provenance information from copy-specific

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44 The project lists individuals who have contributed as volunteers, students, or paid investigators on the website at <https://footprints.ctl.columbia.edu/credits/contributors/> (last accessed 13 October 2022) along with a list of libraries and projects that have contributed datasets. The project has a system for scholarly attribution for each footprint. While each footprint is not peer reviewed on submission, contributors have been trained and vetted before receiving access to the data entry end of the system. There is a regular schedule of data integrity by the directors. Additionally, a small group of vetted users have the ability to edit and revise entries. The back-end records all interventions in the data that can be used to reconstruct the editing process if mistakes are discovered. In this way, a scholarly apparatus is constructed for each footprint which replicates the basics of all systems of citation—to give credit where credit is due and to be able to identify and correct errors. For more details on the functioning of this system and the community, with particular attention to the collaboration of scholars and librarians, see Michelle Chesner et al., “Old Texts and New Media: Jewish Books on the Move and a Case for Collaboration,” in *Digital Humanities, Libraries, and Partnerships*, eds. Robin Kear and Kate Joranson (Cambridge, MA: Chandos Publishing/Elsevier, 2018), 61–73. For recent considerations of the possibilities and pitfalls of the so-called ‘democratic’ aspects of digital labor, see Joseph L. Locke and Ben Wright, “History Can Be Open Source: Democratic Dreams and the Rise of Digital History,” *The American Historical Review* 126 (2022): 1485–1511.

cataloging (usually in partnership with libraries) and uploading datasets after the completion of projects (usually contributed by scholarly authors after publication of their work).<sup>45</sup> The result of this collaborative contribution is a large volume of data points that are derived from the great number of printed books of the early modern period. A conservative estimate of 300 copies per edition suggests that over 2 million copies of Hebrew books were produced before the year 1800, only a fraction of which survive.<sup>46</sup> Given that many of these editions, in fact, produced more than 300 copies, sometimes ten times more, we can estimate an extraordinary sum of printed book copies in Hebrew and in languages that use Hebrew characters, not to mention the large number of printed copies of 'Judaica' in other languages. Based on current data, we estimate an average of three identifiable 'footprints' per book (although dozens of other actors not reflected in the historical record may have interacted with the book after the moment of print). Taking 2 million individual copies of Hebraica as our starting point, we may be talking about 6 million or more data points for analysis. Even if, conservatively, only 10% of these copies survived, that would still leave a remarkable 200,000 book copies to assess, which leaves us with a potential for nearly 600,000 footprints to be gleaned from them.<sup>47</sup> To consult that volume of books—and more importantly to interpret the findings—would be beyond the capacity of any single individual. But a digitally facilitated collection and analysis of data—even a sample of the available possibilities—now makes such an inquiry possible.

In addition to enabling large-scale analysis, the digital medium facilitates a flexible combination of aggregated data for different scholarly objectives. Put differently, whereas the input process relies upon the digital medium to bring together the dataset, *Footprints'* search functions provide access to the data points for recombination in various forms. Like the minuscule dots of a pointillist painting, one sees something different when standing at a distance and viewing the whole from the perspective of the many. The various data points from scholars working on individual libraries, traveling owners, reading habits, probate inventories, and other sources come together beyond the individual

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45 Because MARC records include fields that co-relate to those in a footprint record, it is relatively simple to transfer catalog records into a format that can be uploaded into *Footprints*, and vice versa.

46 On print runs, see the works cited above, n. 14.

47 It should be noted that these numerical estimates, while referring to individual copies, do not consider still further subdivisions based on the materiality of these copies: their physical size (folio, quarto, octavo, duodecimo) and how that size impacted their use and motion, their binding, the type of paper on which they were produced, and their ornamentation.

projects. Unlike a pointillist painting, however, each point (or a small group of points) can be extracted and ‘read’ on its own.

*Footprints*, by design, does not separate the input of data and the analysis of data into different sequential phases of scholarship. As a happy result, *Footprints* acts not only as a single project but as a space for scholars to engage in ongoing virtual dialogue. In the early modern Republic of Letters, scholars shared information and conversation about how to interpret the information, sometimes with quite different conclusions. In *Footprints*, conversation is bounded (by the scholarly interests of our day) and unbounded (building in flexibility and open-ended connections) at the same time.

## 7 Searching and Querying: Using the Dataset

*Footprints’* design as a relational database represents not only a source of information, but permits an open-ended structure in which researchers can apply a variety of questions to different combinations of the data.<sup>48</sup> Although *Footprints* was conceived of and is directed by a leadership team with particular research questions, it is also designed to be used for the research agendas of other scholars with their particular questions. By separating the data input from the data organization, the website places a measure of autonomy and independence into the hands (fingers) of the end-user. Individual researchers query the database and receive a filtered set of results from the thousands of entries, tailored to their particular research aims. The results of such queries visually represent the data in ways that individuals may then interpret and analyze to offer richer interpretations of the history of the Jewish book. The design of the database allows for as-yet unanticipated questions and agendas.

*Footprints* is animated by a goal that the digital humanist and book historian Ryan Cordell has labeled speculative bibliography. “Speculative bibliography,” he writes, “recognises that a unique affordance of digital media is the ability to rapidly reorganize or reconfigure its contents and seeks to identify meaningful patterns for exploration within collections that are often messy and unevenly

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48 We do not, however, claim that the user interface is a neutral tool. The framing of the initial question—what can we learn by focusing on the individual copy of a printed book as an artifact moving through history—frames the database and its search engine, just as collection development policies shape the ostensibly neutral library or archive. For a classic statement of this issue, see Michel-Rolph Trouillot, *Silencing the Past: Power and the Production of History* (Boston: Beacon Press, 1995).

described.”<sup>49</sup> Cordell’s speculative bibliography challenges the static nature of the traditional bibliography. A census of extant copies of a literary work or a particular edition of a book<sup>50</sup> can be “messy and unevenly described,” since the provenance data that is knowable is disparate and depends on availability of evidence. However, in a published bibliography, the information is unchanging—unless a second edition of a monograph or a follow-up study is produced, and then that iteration is static as well. In addition, the printed bibliography also organizes the material in one or more structured formats. A reader cannot immediately see books owned by the same individual, or sold by the same dealer, unless there are specific indices created for this purpose. Our relational database, on the other hand, allows a user to ‘model relationships’<sup>51</sup> between books and the people who interact with them. Indeed, as the dataset is continually updated and expanded with new footprints, the model itself becomes dynamic and not static.

Another way that the digital medium gives more tools for analysis rather than a final narrative-form argument is in the possibilities of visual representation. The *Footprints* website offers a representation of data in two forms: one in a table, another in a map, each of which is designed to satisfy different kinds of research questions and goals. These produce different kinds of visuality, some offering snapshot images of a moment in time, a particular place, or person, while others reveal movement and mobility, and change over time.

*Footprints*’ table-view is the format designed to explore a particular moment, place, or person, granting a detailed view of inventories at a fixed point. The tables include a variety of data from the records, including footprint information (historical actors, dates, places), as well as information about the particular imprint to which the footprint attests. *Footprints*’ table-view can be used to focus on a particular place at a particular moment in time or the range of places or people connected to a book at a particular moment (see Fig. 4 above). The table-view can draw our attention to the collecting proclivities of an individual, the intellectual resources of a community of readers, or the access to particular printing shops by a traveling merchant. At the same time, the table can draw our attention to what is missing, for example, subjects or genres that

49 Ryan Cordell, “Speculative Bibliography,” *Anglia: Zeitschrift für englische Philologie* 138 (2020): 519–531; quotation on p. 522.

50 E.g., Seymour de Ricci, *A Census of Caxtons* (Oxford: Bibliographical Society at the Oxford University Press, 1909); Eric Rasmussen and Anthony James West, *The Shakespeare First Folios: A Descriptive Catalogue* (New York: Palgrave Macmillan, 2012).

51 Cordell uses the phrase “model textual relationships” in reference to other issues of book format, size, *mise-en-page*, etc. We have borrowed this terminology to refer to the ways our database connects extra-textual and para-textual relationships.

were absent from a particular time and place or print shops whose products did not penetrate an area.<sup>52</sup>

The second type of visualization is that of maps designed to reflect change over time and space.<sup>53</sup> The ‘Pathmapper’ interface invites users to establish queries that show the vectors of movement, often in large-scale clusters with attention to the grand sweep of relations between places, rather than the details of names of users. Movement, by definition, requires at least two points (point A to point B), and so the mapping visualization invites a different perspective, generating the movement of at least one *book copy* (often with multiple associated footprints) rather than the moment of time captured in a single footprint. Pathmapper also features a timeline at the bottom of the screen which allows users to attend to shifts over time. Different search queries can be layered atop each other, offering different vehicles for comparison. A user might produce separate searches for the movement of incunabula copies in the fifteenth, sixteenth, and seventeenth centuries, respectively. They can then combine all three searches to obtain a portrait of the early modern period, or they can look at the results for each of the centuries in isolation to gain a comparative view of different periods within the era.

Pathmapper is a tool for interpretation and analysis, not a digital exhibition of research results. The representation of table- and map-views enables viewpoints and interpretive frameworks that are different from those in narrative form.<sup>54</sup> A map that represents the movement of books in their spatial dimensions allows readers to apprehend points of context that are not textually represented. Sometimes recognizing the proximity of outlying locations to centers of power is taken for granted in textual sources and therefore not made explicit, but it is significant when acknowledged by the scholar who takes note of locations on a map. Maps offer an opportunity to

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52 The results from the table-view can be exported, enabling the user to save the results of their searches and to further organize their personalized data according to their particular research needs.

53 We also have several footprints that reflect interaction of a book copy and users over time, but in one place. The example above of a book that changed ownership from Meyer Sulzberger to Dropsie College to Annenberg Research Institute to Penn’s Katz Center while remaining in the same city and sometimes at the same physical location is not fully captured by our mapping function at present. Likewise, a work expurgated in Mantua in 1597 and again in 1617 will show no movement on our map even if it is possible that the inquisitors worked in different locations within the same city. At present, our mapping function is not precise enough to capture local moves within a city.

54 Stephen Robertson, “The Differences between Digital Humanities and Digital History,” in *Debates in the Digital Humanities*, eds. Matthew K. Gold and Lauren F. Klein (Minneapolis: University of Minnesota Press, 2016), e-version at <https://dhdebates.gc.cuny.edu/read/untitled/section/ed4a1145-7044-42e9-a898-5ff8691b6628#ch25>.



interpolate between multiple known data points, bringing other evidence or historical knowledge, to infer unknown, presumed, but likely intermediary steps between two known points. For example, if we see the movement of a book between Venice and Oran, a scholar can interpolate their knowledge of the crucial intermediary role of Livorno in the Hebrew book trade between European print centers and North Africa, thus inserting an important (albeit unattested) point of motion into the path of this book.<sup>55</sup> This is the moment when the narrative historian often makes use of ‘perhaps,’ a word that should also be kept in mind by the producers and viewers of the visualizations. The arcs that connect dots on the map help us imagine potential routes, but they are not representations of seamless journeys or actual routes. We must resist seeing this representation as a conclusion, and instead take it as material ripe for interpretation.

Still other result-pages on the website offer other avenues for exploration. For example, each ‘literary work’ also has its own page that combines a ‘table’ showing all footprints connected to all book copies associated with the work, and a reference map showing all locations recorded that connect to the work. This visualization represents a census of copies and provenance of those copies of all editions of a single literary work (see Fig. 5).

Both the map and table are determined by the user’s search criteria and parameters, and are open to variation. A casual browser may simply scroll through the pages of information, allowing the information to wash over them until something of interest catches their eye.<sup>56</sup> The map is dynamic, allowing users to focus on different levels of granularity, and can track change over time. More specifically, the user can generate a variety of targeted inquiries, narrowed by keyword, publication date of the printed material, date of the historical evidence, the book’s movement in time and place, or ranges thereof. These different levels of granularity can be constructed by selecting shorter or longer time-spans, ranging from single years to centuries. The different levels of granularity also offer different approaches to ‘gaps’ in the historical evidence. For some kinds of research questions, the timeline generated in Pathmapper can reveal in ‘blank space’ what is missing from the dataset and point us toward further research to be done. In other cases, the ‘big approach’ means that the gaps matter less.

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55 On the connections between Livorno and North Africa, see Francesca Bregoli, “Hebrew Printing and Communication Networks between Livorno and North Africa, 1740–1789,” *Report of the Oxford Centre for Hebrew and Jewish Studies* (2007–2008): 51–59.

56 Some users may do this simply by browsing the database; others may choose to download csv files for more complex computational analyses. The visualization functions offer a way to proceed from exploration to argument.

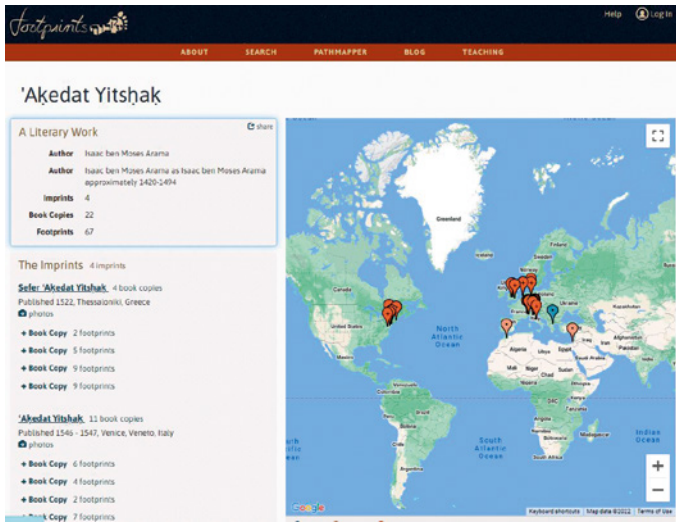


FIGURE 5 *Footprints*, literary work page

## 8 Conclusion: Jewish Book Copies and Global Book Cultures

Jewish books pose a particularly fruitful category for investigation and comparison precisely because 'Jewishness' has been constituted in different ways across time. Jews lived as participants in local cultures. They did not exercise territorial sovereignty, and thus a study of their books offers a different framework than one encompassed by a particular national-territorial-linguistic community. *Footprints* is part of an exciting and emerging trend exploring transnational production and dissemination of printed books beyond the nation-state focus of many of the large-scale bibliography projects of the twentieth century.<sup>57</sup> The instruments for exploring the Jewish book trade alongside other examples of national and transnational book trades invites generative material for comparison, especially as we refine our technology for linking data with other projects.

In addition to offering an instrument (the open-source code of the database) and a template (the project as a whole) that can be used for the study of other corpora of books, the aggregation and organization of data in *Footprints*

57 For an example of such a transnational approach, see Jeffrey Freedman, *Books without Borders in Enlightenment Europe: French Cosmopolitanism and German Literary Markets* (Philadelphia: University of Pennsylvania Press, 2012); and the projects such as MEDATE, FBTEE, ABO, and AOR, referenced above.

also adds to the history of global book cultures since the fifteenth century. Reconstructions of the movement of Jewish books both within and across these contexts represent an invaluable contribution to our understanding both of the Jewish past but also the wider cultural, political, and social contexts in which Jews lived and acted. Documentation of the buying, selling, destruction, censorship, and confiscation of Jewish books, whether codex or scroll, print or manuscript, was conducted within wider contexts of scholarship, markets, and regional cultures. Jews' diasporic experience of both belonging to local contexts and traversing borders presents scholars of multiple national, regional, and thematic subjects with important information about the transmission of religious, scientific, and literary knowledge across worlds. Specialists in Jewish studies will recognize this argument as a microcosm of a larger discussion of Jewish history. Although Jewish history has to a great extent come out of the 'historiographic ghetto,' limitations of language and institutional frameworks sometimes prevent even well-intentioned surveys of book history from taking full account of Hebrew and Jewish books and Jewish readers and actors.<sup>58</sup>

*Footprints'* contribution to the study of book culture beyond Jewish domains builds upon earlier important insights about the inter-confessional character of the making and dissemination of books in early modern Christian Europe. It has, for example, been well demonstrated that the early modern print shop represented a significant space of inter-religious cooperation, as Jewish and Christian craftspeople mingled and collaborated in the making of Hebrew books.<sup>59</sup> Far less is known about the post-print history of Jewish books and their impact on non-Jewish readers, but the extant research has already demonstrated the importance of Jewish literatures and Jewish agents well beyond Jewish reading circles, noting, for example, the interest of early modern Christians (both Catholic and Protestant) in Jewish texts and their importance to the writings of the reformers of the sixteenth century and the political thinkers of the seventeenth.<sup>60</sup> Only the widest view of the total literary diet of

58 We borrow the phrase 'historiographic ghetto' from Debra Kaplan and Magda Teter, "Out of the (Historiographic) Ghetto: European Jews and Reformation Narratives," *Sixteenth Century Journal* 40 (2009): 365–394.

59 For a brief description, see David Stern, "The Rabbinic Bible in Its Sixteenth-Century Context," *The Hebrew Book in Early Modern Italy*, eds. Joseph Hacker and Adam Shear (Philadelphia: University of Pennsylvania Press, 2011), 76–77 and the references on 253, n. 2.

60 For a perspective on Jewish cultural and intellectual history as part of the wider story of early modern European learned culture, see Anthony Grafton's *Worlds Made by Words: Scholarship and Community in the Modern West* (Cambridge, MA: Harvard University Press, 2011). See several recent studies: Eric Zimmer, "Jewish and Christian Hebraist Collaboration in Sixteenth Century Germany," *The Jewish Quarterly Review* 71(2) (1980): 69–88; Adam Sutcliffe, "Hebrew Texts and Protestant Readers," *Jewish Studies Quarterly* 7

readers who were not Jewish (through the examination of Christian owners' marks in Jewish books) as they consumed Jewish material allows for an appreciation and understanding of the flows of intellectual culture. We contend that this is but the tip of the iceberg. Much research remains to be conducted about the circulation of information by and about Jews through the markets and homes of non-Jews. A growing history of the actors involved in transmitting information (particularly in early modern Europe), is enriched by exploring the means by which books traveled and were re-sold into new contexts from other markets. *Footprints* also records a wide array of interventions and encounters of Christians (including many Jewish converts) with Hebrew books who served as post-Tridentine expurgators. Here, the project records many encounters that were not about ownership or collecting but were nonetheless moments of contact between cultures through material texts. The inclusion of Jewish books in explorations of censorship, for example, allows investigation of the scope and reach of the phenomenon as well as its divergences across literary genres.

Moreover, the unboundedness of *Footprints'* tracing of books both across time and across geographies enables the inclusion of data on the spread of Jewish books beyond Christian Europe and its early modern colonies. The most obvious initial venue is the Mediterranean, where books from Italy circulate to the Ottoman empire and North Africa; and Hebrew books printed in the Ottoman world made their way to Europe and North Africa. Our data also shows the presence of European printings of Hebrew books among Jews in the Persianate world and the Arabian Peninsula.<sup>61</sup> *Footprints* also offers important material for the study of modern major library collections and their formation. At the same time, however, the transnational focus on copies in major and minor collections, and in historical formations (even recording books

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(2000): 319–337; Piet W. van Boxel, “Robert Bellarmine, Christian Hebraist and Censor,” in *History of Scholarship: A Selection of Papers from the Seminar on the History of Scholarship Held Annually at the Warburg Institute*, eds. C. R. Ligota and Jean-Louis Quantin (Oxford: Oxford University Press, 2006), 251–275; Eric Nelson, *The Hebrew Republic: Jewish Sources and the Transformation of European Political Thought* (Cambridge, MA: Harvard University Press, 2011); Stephen G. Burnett, *Christian Hebraism in the Reformation Era, 1500–1660: Authors, Books, and the Transmission of Jewish Learning* (Leiden: Brill, 2012); Anthony Grafton and Joanna Weinberg, *“I Have Always Loved the Holy Tongue”: Isaac Casaubon, the Jews, and a Forgotten Chapter in Renaissance Scholarship* (Cambridge, MA: Belknap Press of Harvard University Press, 2011).

61 See <https://footprints.ctl.columbia.edu/footprint/2947/>; <https://footprints.ctl.columbia.edu/footprint/4870/>. As more data is added, the Jewish diaspora in South and East Asia in the modern period will likely feature more broadly as well. As yet, our data does not reveal the same interconnections of Jewish and non-Jewish book owners and users in the Islamicate world that we saw in Christian Europe. This is a field still ripe for inquiry.

no longer extant) offers an important corrective to a tendency to privilege national and other large institutional libraries in telling the story of 'rare' books in the modern period.

Like all digital history projects, *Footprints* has significant continuities with traditional scholarship, not least in the fact that it, like even the most comprehensive research, is always subject to further revision, refinement, and—as new evidence comes to light and new methods are developed—potential refutation. With *Footprints*, the rate of change is accelerated (which may feel uncomfortable) as the real-time contribution of scholars (perhaps scholars even unknown to a scholar using the database) add incidental data that alter the map, graph, or chart of datapoints. Yet its current state still already offers data and invites the materials and means to analyze and interpret phenomena from the past in productive ways.

At this juncture *Footprints* still offers more questions than answers. The project co-directors anticipate that significant macroscale results will only emerge when a threshold of 100,000 footprints is crossed. Even then, as always, quantitative results will require analysis based on context and specialized knowledge. And yet, the scaffolding for such data to be brought into meaningful frames of interpretation is already in place, as is the network of enthusiastic contributors and collaborators.

As an instrument and a dataset still under construction, then, much of the 'payoff' will come in the future. However, *Footprints* has already offered contributions to the interdisciplinary field of book history. The introduction of the 'footprint' concept provides a way to link provenance history with bibliographic description, as a deeply contextualized material instantiation of an object of culture. *Footprints* adds to the growing scholarly discussion that considers printed books as individual material artifacts the way manuscripts have already been conceived.<sup>62</sup>

The priority of questions over answers is an explicit goal of this project and an intrinsic component of digital scholarship. Interdisciplinarity and collaboration through the digital space also accelerates serendipitous discovery. The digital medium is a rich space for the incidental findings of one scholar to serve the essential research aims of another, and for new approaches to visualizing, analyzing, and interpreting data in the study of the (Jewish) book.

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62 See, for example, citations of *Footprints* in Rachel Greenblatt, "Building the Past: Historical Writing on the Jews of the Bohemian Crown Lands in the Early Modern Period," *Studia Judaica* 19 (2016): 11–40; at 31, n. 68; Martina Mampieri, "From Menasseh ben Israel to Solomon Proops: Amsterdam Jewish Druckwesen in the Library of Isaiah Sonne," *Studia Rosenthaliana* 46 (2020): 97–116, esp. 100; Flora Cassen, "Early Modern Jewish History: Ongoing Trends, Global Directions," *Church History and Religious Culture* 97 (2017): 393–407, esp. n. 20.

Collaborators entering new footprints and users searching for information can connect previously disparate pieces of information.

Like Offenberg's 1990 call for analog assistance that invited new contributions to the study of Hebrew incunabula through grand collaborations,<sup>63</sup> the meeting of scholars, data, and diverse agendas in the digital sphere is the very basis of *Footprints'* ever-expanding body of contributions and collaborations. Using the digital medium and a broad collaborative model, *Footprints*, like other digital projects, takes full advantage of the scholarly republic of letters in our own time.

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63 Offenberg, *Hebrew Incunabula in Public Collections*, xxxii.