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Data Scraping YouTube for the Study of Lieder Reception

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Data Scraping YouTube for the Study of Lieder Reception

A growing body of literature has shifted aesthetic attention from composition to performance, or the performing activity, and asserts that the act of performance creates meaning.¹ Scholars have emphasized differences between the passive consumption and active making of—or even listening to—music.² As I sought to understand the impact of performance on Alma Mahler's legacy, I identified the need to gather as much data as possible on who, what, where, when, and why her songs were performed. This need led me to evaluate the metadata associated with recordings of Alma Mahler's songs in the WorldCat union catalog and the video sharing platform YouTube. Recent studies have shown the utility of leveraging big data for musicology, although few scholars have done so to investigate reception history. This essay outlines one approach to data scraping YouTube with emphasis on the value to those researching recent Lieder reception, and in doing so highlights some of the promise and limitations associated with web scraping.

¹ See, for example, Nicholas Cook, *Beyond the Score: Music as Performance* (Oxford: Oxford University Press, 2015).

² This understanding has parallels outside of the discipline; Roland Barthes, for example, has argued that "the goal of literary work (of literature as work) is to make the reader no longer a consumer, but a producer of the text." Roland Barthes, Richard Miller, Richard Howard, and Honoré de Balzac, *S/Z* (New York: Hill and Wang, 1974), 4. Within music, the work of Christopher Small has been influential. *Musicking: The Meanings of Performing and Listening* (Middletown, Connecticut: Wesleyan University Press, 1998).

Data Scraping in the Humanities

There is a tradition of skepticism among humanists towards quantitative or empirical methods, which Matthew G. Kirschenbaum acknowledges in his study of data mining techniques and their utility and promise for the digital humanities.³ There is nonetheless a growing precedent for leveraging digital humanities approaches in service of musicology.⁴ Nicholas Cook has argued that “broadly scientific methods can open up otherwise inaccessible areas of culture for analysis: in doing this, they do not substitute for, but rather add value to traditional humanities approaches.”⁵ Franco Moretti was among the first literary scholars to recognize the opportunities afforded by leveraging big data; his theory of “distant reading” elucidates networks and connections that can be drawn through computational analysis of large literary corpora.⁶ Musicologists have already begun to leverage literary and musical corpora and computational methods to conduct distant readings of diverse topics, but to date there have been few such studies relating to nineteenth-century music.⁷

Music scholars increasingly make use of bibliographic data. Several studies indicate the viability of library-generated metadata for musicological study.⁸ Heather Platt and Michelle Urberg independently wrote overviews of digital musicology projects; both highlighted relevant

³ Matthew G. Kirschenbaum, “The Remaking of Reading: Data Mining and the Digital Humanities,” presented at *The National Science Foundation Symposium on Next Generation of Data Mining and Cyber-Enabled Discovery for Innovation*, Baltimore, MD, 2007.

⁴ Recently evidenced by the special issue “The Digital Humanities and Nineteenth-Century Music” in *The Nineteenth-Century Music Review* 18, no. 1 (2021): 1-144.

⁵ Nicholas Cook, “Between Art and Science: Music as Performance,” *Journal of the British Academy* 2 (2014): 23.

⁶ Franco Moretti, *Distant Reading* (London: Verso Books, 2013).

⁷ A recent example is Elizabeth Monzingo and Daniel Shanahan, “The Expression of Self and Grief in the Nineteenth Century: An Analysis through Distant Readings,” *Nineteenth-Century Music Review* 18, no. 1 (2021): 83–107.

⁸ See, for example, Klaus Keil and Jennifer A. Ward, “Applications of RISM Data in Digital Libraries and Digital Musicology,” *International Journal on Digital Libraries* 20, no. 1 (2019): 3–12, <https://doi.org/10.1007/s00799-016-0205-3>.

digital repositories, aggregators, and projects, some of which made use of bibliographic data.⁹ Sandra Tuppen, Stephen Rose, and Loukia Drosopoulou discuss ideas for the analysis and visualization of bibliographical data for musical materials based on bibliographic information in their article, “A Big Data History of Music.”¹⁰ Scholars have also looked to musical recordings for empirical studies.¹¹ Eamonn Bell investigated the deep linking within YouTube videos that facilitates time-coded comments and is one of the few music scholars who have studied content on this platform.¹² Studies of music on YouTube most frequently investigate popular music and do not concern nineteenth century music. No studies that I can identify have automated the scraping of YouTube metadata to investigate a composer’s reception history.

Data mining and social networking platforms—and not just the analytical techniques associated with both—are not unproblematic. Scholars have highlighted the challenges of mining data on social networking sites, noting the undue influence of corporations.¹³ Despite its limitations, data scaping is currently the most efficient way to collect data from online video-sharing platforms. Digital humanities approaches are still evolving and best practices for interrogating these data have not yet been codified. Given the prominence of YouTube,

⁹ Heather Platt, “The Digital Humanities and Nineteenth-Century Music: An Introductory Overview,” *Nineteenth-Century Music Review* 18, no. 1 (2021): 3-18. Michelle Urberg, “Pasts and Futures of Digital Humanities in Musicology: Moving Towards a ‘Bigger Tent,’” *Music Reference Services Quarterly* 20, no. 3-4 (2017): 134–50.

¹⁰ Sandra Tuppen, Stephen Rose, and Loukia Drosopoulou, “Library Catalogue Records as a Research Resource: Introducing ‘A Big Data History of Music,’” *Fontes Artis Musicae* 63, no. 2 (2016): 67–88.

¹¹ See, for example, Stephen Cottrell, “Big Music Data, Musicology, and the Study of Recorded Music: Three Case Studies,” *Musical Quarterly* 101, nos. 2-3 (2018): 216–43.

¹² Eamonn Bell, “Exploring Time-Coded Comments on YouTube Music Videos: The Past, Present, and Future of an Emerging Source for Digital Musicology” at *Like, Share and Subscribe: YouTube, Music and Cyberculture Before and After the New Decade*. Lisbon, Portugal (October 1–3 2020), <https://www.eamonnbell.com/blog/2020/10/03/lisbon-youtube-2020/>.

¹³ Helen Kennedy and Giles Moss, “Known or Knowing Publics? Social Media Data Mining and the Question of Public Agency,” *Big Data & Society* 2, no. 2 (2015): 1–11.

investigating its data provides a more complete picture of how performers and listeners are engaging with Lieder composers in the twenty-first century.

Alma Mahler Recordings in WorldCat

I conducted an analysis of Alma Mahler recordings in WorldCat to establish some context for the data yielded from harvesting YouTube results. I ran an author search for “Mahler, Alma” in WorldCat’s Online Catalog on February 25, 2022 and limited the results by format to sound recordings.¹⁴ I exported the resulting 271 records with unique OCLC numbers in a .CSV file and sorted the exported data in turn by “publisher,” which also includes date and publisher location, “title,” and “author” in order to identify duplicates, irrelevant content, and songs cataloged individually.¹⁵ After excluding recordings that repackaged the same content in another format and removing results that did not include Mahler’s Lieder, I identified 107 unique albums.

I then sorted the recordings chronologically and organized them thematically by content, excluding 2020-2022 recordings from the analysis. There is an increase of recordings featuring Lieder by Alma Mahler from one recording in the 1970s, seven recordings in the 1980s, twenty-three in the 1990s, thirty-eight in the 2000s, and thirty-six in the 2010s, as shown in Figure 1.¹⁶ The metadata suggest that at least thirty recordings were presented as recitals within a

¹⁴ Although “Mahler, Alma, 1879-1946,” is the authorized form of her name in the Library of Congress Authorities, I excluded the dates to ensure that results included all relevant recordings, especially those cataloged by libraries outside of the United States.

¹⁵ Duplicates exist in WorldCat for a variety of reasons. A more comprehensive account of record uniqueness and duplication in OCLC records can be found in OCLC documentation, “When to Input a New Record,” accessed 7 March 2022, <https://www.oclc.org/bibformats/en/input.html>. Relevance is easier to confirm with YouTube, which offers listeners immediate gratification. I omitted WorldCat recordings when it was not clear if Mahler’s songs were included.

¹⁶ Cataloging is frequently done months, or even years, after a library obtains a recording. Accordingly, it is expected that the number for the 2010s will increase slightly in the coming years.

conservatory or educational setting¹⁷ and that mezzo-soprano and soprano voice types prevail among performances, but this information is not necessarily populated for each recording and cannot easily be confirmed.

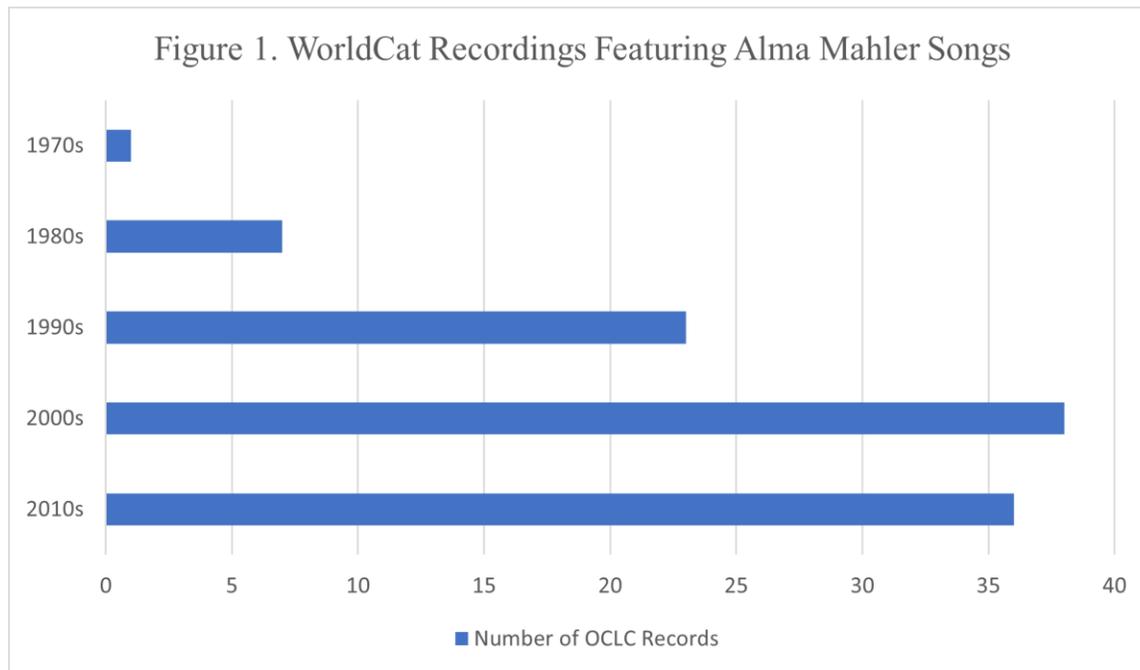


Figure 1. WorldCat Recordings Featuring Alma Mahler Songs

I sorted recordings into one of the following categories: 1) exclusively Alma Mahler Lieder, 2) Lieder by Mahler and her contemporaries, 3) anthologies featuring the works of female composers, and 4) assorted repertoire. As shown in figure 2, eight recordings featured only the songs of Alma Mahler, twenty-seven focused on the music of Mahler and other contemporaries. Thirty-three recordings featured primarily or exclusively female composers. The remaining programs did not focus exclusively on the work of Alma Mahler, her contemporaries,

¹⁷ The increase in the number of Alma Mahler recordings may be influenced by such unrelated factors as library cataloging policies for music department recital recordings.

or female composers. The data by decade suggests that since the 2010s Mahler’s music is less frequently restricted to women-only recordings than previously.¹⁸

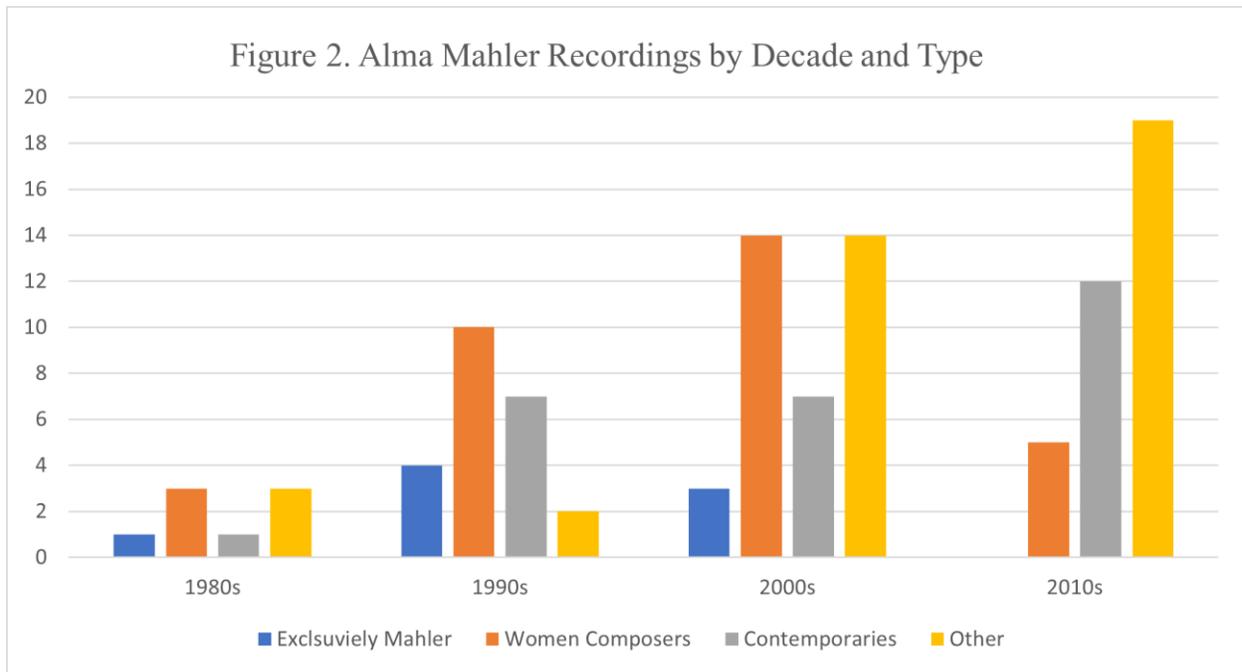


Figure 2. Alma Mahler Recordings by Decade and Type

The WorldCat data demonstrate that Mahler’s Lieder are recorded at an increasing rate and are less likely to be relegated to specialized programs of women’s music than previously. Numerous recordings programmed Alma Mahler’s music along with that of Gustav Mahler, Alexander Zemlinsky, Arnold Schoenberg, and other contemporaries. Various recordings include Mahler’s work alongside canonized Lieder by Johannes Brahms, Franz Schubert, and Hugo Wolf. Recordings of Mahler’s songs also seem to be growing more mainstream. There were initially few recordings of her works on major labels, but more recently, well-known singers

¹⁸ A decline in the performance of women’s music may be related to a decline in the research and discussion surrounding the topic of women composers presses since the 1990s. Sally Macarthur, Dawn Bennett, Talisha Goh, Sophie Hennekam, and Cat Hope, “The Rise and Fall, and the Rise (Again) of Feminist Research in Music: ‘What Goes Around Comes Around,’” *Musicology Australia* 39, no. 2 (2017): 73–95.

including Kate Lindsey and Barbara Hannigan have recorded Mahler's songs on labels that boast wide distribution.

WorldCat data provide useful insights into some of the performers and performances of Alma Mahler's music. Lieder are frequently performed in festivals, recitals, and educational venues, however, that do not necessarily result in a formally produced recording. I identified a need to collect and analyze data from a more casual source to which more performers have access: YouTube. The music available on YouTube, and other online streaming music or video platforms that host user-generated content is frequently not represented within the bibliographic universe of WorldCat. Collecting and then comparing WorldCat and YouTube data refines our understanding of who, what where, when, and why Lieder are performed in the twenty-first century.

Alma Mahler Recordings on YouTube

WorldCat is a library-led platform whose structured metadata and indexes allow for specialized searching and collocation of like materials. YouTube, however, is a commercial platform that is designed for ease of uploading and sharing, and not for precise searching. There is no author index in YouTube, and it is accordingly challenging to separate content about Alma Mahler from performances of her music. YouTube grows more rapidly than WorldCat and boasts more recorded music. YouTube contains, for example, many hundreds of recordings of Alma Mahler songs, and collecting the relevant metadata for these requires automated assistance.

I employed DataMiner, a screen scraping plugin for the Chrome web browser that harvests webpage content, metadata, and other technical information from webpages using automated processes. DataMiner is one of numerous software applications for scraping data from websites; those with programming skills need not rely on an out of the box solution. DataMiner

can be programmed to identify and capture desired data points and to crawl specified webpages, both of which facilitated the automated capturing of data about recordings of Mahler Lieder uploaded to YouTube.¹⁹

Before I could program Data Miner by creating what the platform calls “recipes,” however, I had to investigate how YouTube’s relevancy ranking worked with Mahler’s songs. In order to achieve the most relevant results I searched Alma Mahler and the song title, both in quotation marks.²⁰ Although refining my search queries helped with the relevance of search results, it also led to the omission of several valid performances of her work. Because all metadata is user-generated the title and descriptive information is rife with typographical errors. I found recordings of “Laue Sommernacht” labeled as “Blave Sommernacht,” for example, and I also found recordings featuring groups of songs that did not feature individual song titles in the scraped text. Although searching by song title yielded the most relevant results, I ultimately decided to search “Alma Mahler” and “Alma Schindler”. Because YouTube is a commercial platform, promoted results for other classical music videos were frequently included in groups as recommendations within the results for the searched content. These results were impossible to exclude, and I had to manually delete them.

Data Miner recipes specify which elements from the webpage will be scraped and exported. Figure 3 shows a page of YouTube results for “Alma Mahler” and the first part of the recipe process in which the area of the results to be included is specified. After that is

¹⁹ To use DataMiner, the plugin must be installed in the Chrome web browser. After installation, an account is required to create recipes and begin scraping data and crawling websites. The free account was sufficient for my needs, but users can also purchase an account with enhanced features or pay for recipes to be created and the work done for them.

²⁰ A resulting URL looked like this:

https://www.youtube.com/results?search_query=%22alma+mahler%22+%22laue+sommernacht%22.

established, the particular data points of interest, called columns are configured. In this case, I wanted to collect URL, title, number of views, date posted, channel, and description.²¹

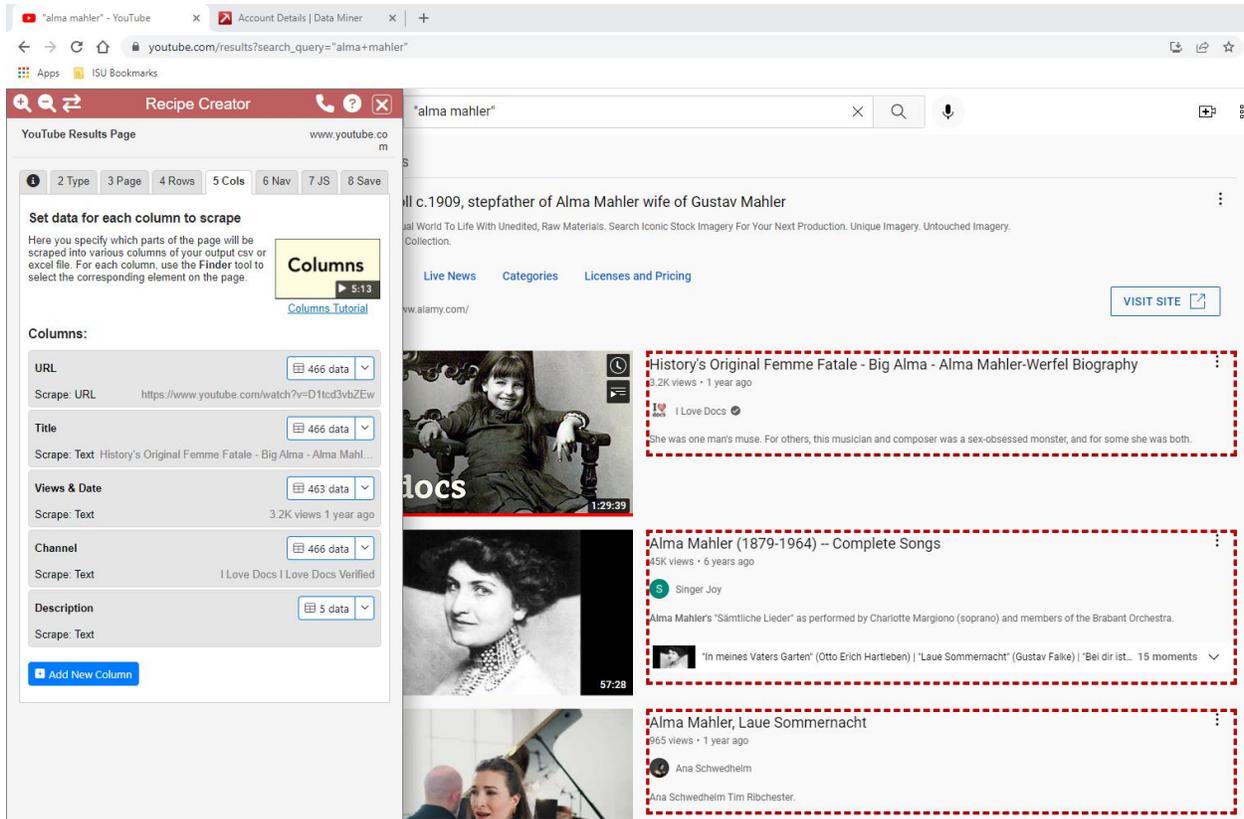


Figure 3. YouTube Results List with Data Miner Recipe Creator

After scraping data from all “Alma Mahler” and “Alma Schindler” results on March 7, 2022, I exported the URL, title, channel, number of views, date posted, and description into an Excel spreadsheet. I deduped the data based on URL, because the title, channel, and other data points were not necessarily unique. At this point, I reviewed the results individually to ensure that all were relevant. Of the 675 unique YouTube URLs, only 410 included performances of Alma Mahler’s songs, and not discussions of her life, performances of Gustav Mahler’s music,

²¹ I did not program any navigation between results list pages and their detailed entries, or enable any javascript scripts, but that functionality is supported in the recipe creation process.

or promoted content. With a unique list of URLs, I began the second part of the data scraping process.

I then used Data Miner’s web crawling feature to indicate which webpages I wanted crawled and what data I wanted collected from them. I copied the list of unique YouTube URLs into the application, created a second recipe that would collect the likes, dislikes, date, views, and user comments, and let the program run in the background. Figure 4 shows Data Miner’s Crawl Scrape, which combines web crawling and data scraping functions, in action as the specified recipe is run against the list of webpages. I matched the data from the crawl against the initial data using the URL as a matching point and did additional work to clean up the data, including removing extraneous data added during the export process, deduping characters in specified columns, and replacing characters encoded in non-UTF-8 with the proper characters, for example, FÃ¼nf lieder to Fünf lieder.

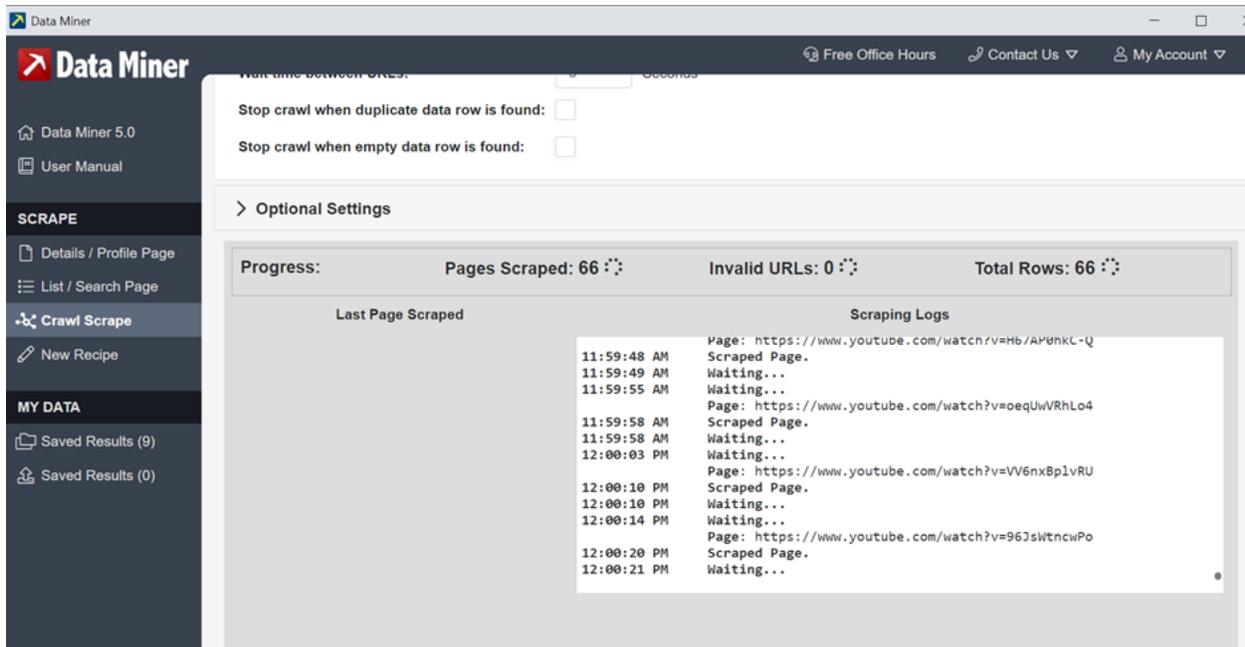


Figure 4. Data Miner’s “Crawl Scrape”

With this data in hand, I could consider commonalities and differences among these recorded performances and compare them to the WorldCat data. Although some of the

recordings on YouTube replicated formally-published content available in WorldCat, many others were not commercial recordings. The diversity of voices, perspectives, and individuals included on YouTube is not commonly found in WorldCat.²² Some performances were recorded in what appeared to be individual's homes, churches, or practice rooms, and not in recording studios or concert halls. The following sections outline some of the questions that YouTube data allow researchers to ask and answer. As with any platform that hosts user-generated content and metadata, there are plenty of caveats. Despite its limitations, however, the number and variety of recordings available in YouTube suggests it to those interested in understanding the performance of any musical genre in the twenty-first century.

When: Timeline

The first Alma Mahler song was uploaded to YouTube on November 27, 2008, around three years after the founding of the video-sharing platform. Uploading has increased since 2008, but not necessarily consistently so. Figure 5 shows the number of videos featuring Mahler songs uploaded to YouTube by year. The spike in 2014 has at least one explanation. Beginning in 2014, YouTube began to tag copyrighted music and notify the rights holder.²³ Since that time licensed Mahler songs on YouTube have been provided by Believe SAS, Naxos, Orchard Enterprises, Rebeat Digital, Sony, Universal, and Warner, among others. With Orchard Enterprises alone providing twelve tracks in 2014, the overall trajectory is skewed. If this

²² Recent studies investigate the systemic racial inequality within classical music institutions. See, for example, Loren Kajikawa, "The Possessive Investment in Classical Music: Confronting Legacies of White Supremacy in US Schools and Departments of Music," in *Seeing Race Again: Countering Colorblindness across the Disciplines* ed. Kimberlé Williams Crenshaw, Luke Charles Harris, Daniel Martinez HoSang, and George Lipsitz (Oakland: University of California Press, 2019): 155–74.

²³ YouTube and Google's announcements and explanation of this change are provided in their blog. Tim Grow for the YouTube Official Blog, December 8, 2014, <https://blog.youtube/news-and-events/mystery-solved-what-happens-when-you>; YouTube Help, "How Content ID Works," <https://support.google.com/youtube/answer/2797370?hl=en>.

licensed content were to be removed, however, a pattern of growth from 2008 to 2021 would be more apparent. More recently, YouTube has automated the description of music tracks included in the YouTube Audio Library or claimed by one of YouTube's copyright management tools; the matching and classification methods employed are not optimized for classical music.²⁴

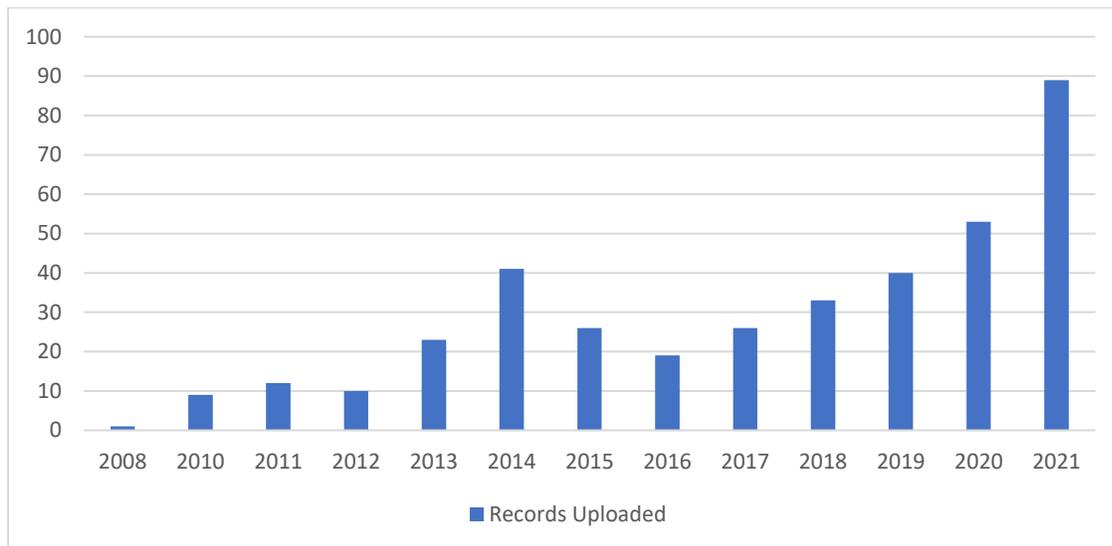


Figure 5. Alma Mahler Songs Uploaded to YouTube by Year

Dates are treated differently in YouTube than in WorldCat. The date captured during data scraping is the date a video is uploaded. This date supersedes any other dates included in the description or other textual fields such as title. Because videos may be uploaded at any point after an event, for example, we cannot be certain that the recitals or concerts from which Mahler songs are excerpted and posted correlate to the YouTube date. WorldCat dates are more standardized, even if they also do not prioritize the performance date in the case of live performances. The date used in WorldCat is most often a date of publication or copyright.

²⁴ Adam Berkowitz recently investigated the implications of YouTube's automated copyright enforcement on classical musicians and found that automated processes frequently designate original performances of works in the public domain as copyrighted. YouTube's Content ID and Facebook's Rights Manager use matching and classification methods that are not optimized for classical music recordings.

Who: Performers and Audiences

Those recording and sharing Alma Mahler's music on YouTube sometimes perform transcriptions and arrangements, and not only the work in its original scoring. The majority of videos feature a single singer and pianist, though at least fifty-two recordings feature orchestral accompaniment, many of which utilize the orchestration by David and Colin Matthews.²⁵ Performances by choral groups singing transcriptions of Mahler songs were also included among the results. Solo performers include several pianists and cornet player Luke Spence.²⁶ A few recordings featured tracks that had been modified or remixed using electronic means.²⁷ Pianists not only performed solo transcriptions of Mahler's works, but also offered piano accompaniment tracks that singers might use to help learn Mahler's songs and prepare for performance.

My analysis of the data did include my listening briefly to verify and add voice type when missing. Alma Mahler's songs in YouTube are most frequently performed by singers with soprano, mezzo-soprano, or alto voice types. 148 records featured mezzo-sopranos, 114 featured sopranos, and 63 included other or unspecified female voices. This is in stark contrast to the four records for baritone and three for tenor and other male voice. Many of the recordings did not list voice type in the available metadata and that is perhaps a limitation of this platform for the study of Lieder. The professional level of performers is challenging to investigate with the data provided. Twenty videos had the terms college, university, or conservatory in the record metadata, and many of these further specified that the performance had been part of a degree recital.

²⁵ Alma Mahler, David Matthews, and Colin Matthews, *Sieben Lieder: für mittlere Stimme und Orchester* (Vienna: Universal Edition, 2001).

²⁶ Luke Spence's transcription of "Lobgesang," 25 February 2022, <https://www.youtube.com/watch?v=oSP28AQMnJc>.

²⁷ One such example is this treatment of Mahler's song "Hymne," 25 February 2022, <https://www.youtube.com/watch?v=k7eXUssbP5M>.

Performances of Alma Mahler songs were uploaded to 190 unique channels. These channels may represent fans uploading the content of others, performers uploading their own content, and official channels uploading content on behalf of professional artists and ensembles. Content is uploaded by festivals, such as Aspect Chamber Music Series; singing contests, such as Redwood Empire Chapter of NATS; and ensembles, whether professional or not, such as SWR Vokalensemble Stuttgart. A few of these channels seem to have considerable user engagement as evidenced by video views, likes, and dislikes. Of the total 468,182 views of Alma Mahler songs in this sample, for example, 252,198, or over half of all views, came from only six channels:

- 97,184 NPR Music – across 1 video
- 47,032 AllaBreve3 – across 7 videos
- 36,134 Singer Joy – across 1 video
- 25,850 Wellesz Theatre – across 1 video
- 24,412 London Review – across 1 video
- 21,586 Vozbiala – across 2 videos

A high number of views may suggest that these channels have a large audience base, that they are providing unique content, that their videos have been added to automated playlists, that their videos rise to the top of the relevancy ranking, whether intentional or not, or that listeners like and engage with these recordings differently.

Similarly, most of the total 4,223 likes and 163 dislikes came from a handful of channels:

- NPR Music: 1700 likes / 52 dislikes – across 1 video
- Singer Joy: 325 likes / 10 dislikes – across 1 video
- liederoperagreats: 258 likes / 5 dislikes – across 42 videos
- London Review: 257 likes / 13 dislikes – across 1 video
- AllaBreve3: 154 likes / 15 dislikes – across 7 videos
- George N. Gianopoulos 154 likes / 3 dislikes –
- Wellesz Theatre 141 / 5 dislikes – across 1 video

Unlike views, which could be attributed to luck, users must log in and actively click the like or dislike buttons. This suggests that certain channels have higher levels of user engagement, and

that some content is perceived as better or worse than others. Of course, the number of videos on a given channel also contributes to the amount of engagement with the like and dislike features; liederoperagreats achieved a relatively high number of likes, but that is due to the fact that they posted forty videos featuring Mahler's songs to YouTube.

What: Content and Context

Whereas WorldCat most often provides musical content in the familiar package of an album, YouTube includes countless variations, from a single song to an entire program. Most of the videos feature individual tracks, which is in line with how the platform is used in the case of much classical music and other genres of music. Song titles are consistently included in YouTube metadata which allows for more granular analysis than the WorldCat data, which does not consistently encode all tracks of a recording. Figure 6 lists the number of recordings by song title and highlights that most are from Mahler's 1910 publication of five songs ("Die stille Stadt," "Laue Sommernacht," "Bei dir ist es traut," "In meines Vaters Garten," and "Ich wandle unter Blumen"); these are consistent across YouTube and WorldCat. The recordings with fewest performances, "Einsamer Gang" "Leise weht ein erstes Blühh," and "Kennst du meine Nächte," were all published posthumously.²⁸

²⁸ Two of these were edited and published by Susan Filler: Alma Maria Mahler-Werfel, *Two Lieder: [for voice and piano]*. ed. Susan M. Filler (Bryn Mawr, PA: Hildegard, 2000). "Einsamer Gang" was published as a supplement to a 2018 issue of *Wagner Journal*.

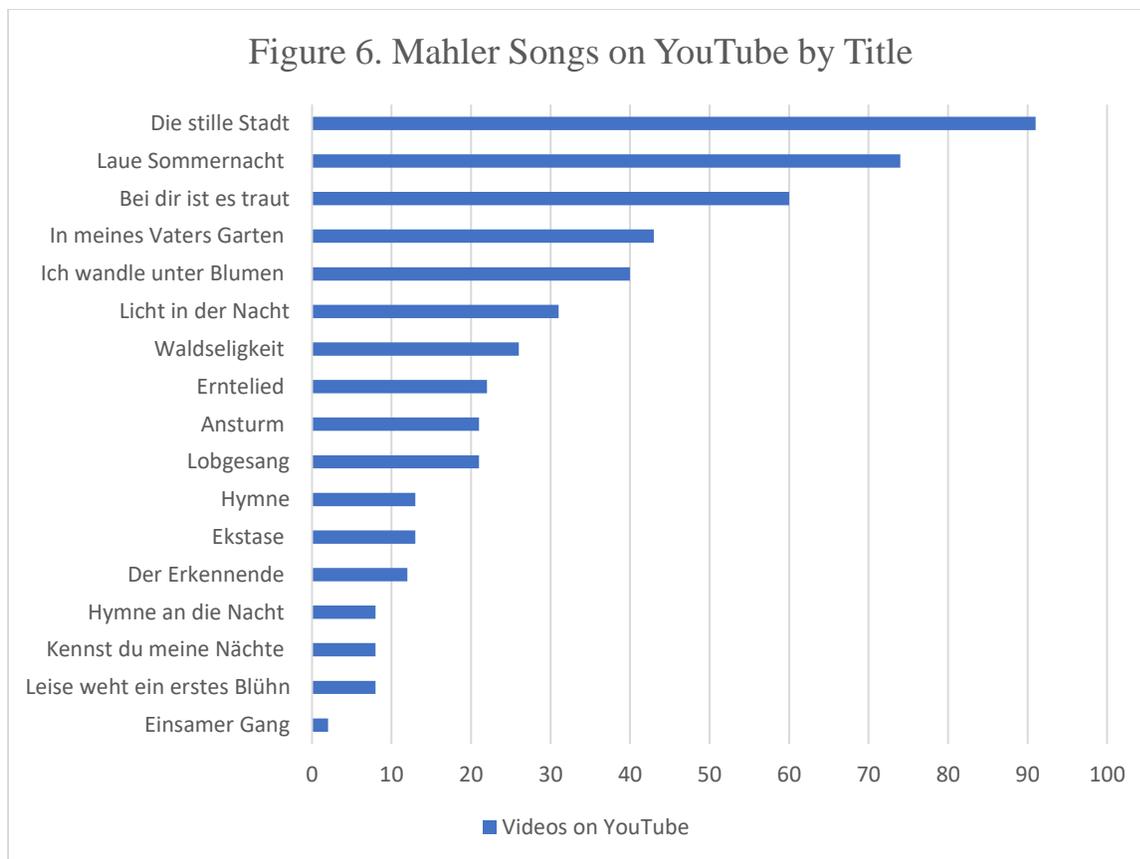


Figure 6. Mahler Songs on YouTube by Title

The inclusion of Alma Mahler’s songs in diverse events is something that is captured in YouTube, but not well-represented in WorldCat. Some of the events in which her songs were included are celebrations of songs written by women composers, theatre events focused on her own life, and even Houston Grand Opera’s parody of the “Real Housewives” franchise.²⁹ Some events were streamed live, which might be analogous to recordings created from live performance. When Alma Mahler’s music is included among the music of other composers, it is worth noting any similarities among the composers, or any patterns among events. In the “Concerto Omaggio alla Donna, Musa e Musicista,” the songs of Clara Schumann (1819–1896)

²⁹ “HGO Real Housewives of Classical Music- Alma Mahler,” accessed 25 February 2022, <https://www.youtube.com/watch?v=hQsVdpos9Zk>.

and Alma Mahler were accompanied by recitations from both composers' respective writings.³⁰ Schumann and Mahler both composed Lieder and their lives did briefly overlap, but both women also wrote diaries, correspondence, and other forms of life writing, which is perhaps the more pronounced similarity and unifying theme of the event. An event called "Art Sung" featured songs of Zemlinsky, Ludwig van Beethoven, Gustav Mahler, and Alma Mahler to bring Alma Mahler's relationships to Zemlinsky and Gustav Mahler to life. It is noteworthy that Alma Mahler's music was programmed in this event; in my initial analysis to remove content that did not include at least one Alma Mahler song, I encountered many videos that used Gustav's music—and not Alma's—to tell her life story.

How: User Engagement

Although WorldCat does support user-generated reviews and tagging, these features are infrequently used in the case of classical music recordings. Perhaps this is because the content is not immediately available for listening, as it is on YouTube. YouTube viewers can engage with the recordings at any point after a video is uploaded and this immediacy empowers content viewers and creators to engage in a more sustained manner with the content and each other. The immediacy also has implications for the reception of content over time and across diverse constituents. Classical music viewers admittedly have far lower levels of engagement with classical music videos than popular music and other performance recordings on YouTube. The description field in YouTube frequently provides texts or translations of Lieder, but also provides commentary that ranges from benign appreciation to hateful stereotypes about composers or performers. It is important to note that the person uploading videos can opt to 'turn off' comments, which can be decided on a case-by-case basis.

³⁰ "Concerto Omaggio alla Donna, Musa e Musicista," accessed 7 June 2022, http://www.archivistoricolafenice.org/scheda_opera.php?ID=25119.

The comments left by YouTube audiences, while typically appreciative and bland, only infrequently deal with the musical compositions performed. Even when they do, they include extramusical remarks that could be understood as sexist. Casio61, for example, wrote: “More advanced harmonies than I was expecting. Number 2 is very interesting, ending on a major 7th chord wasn’t common in 1915. The woman had some talent.”³¹ Other commenters take her more seriously, but nonetheless forefront Gustav Mahler, or other men in her life. Paul Meyer wrote: “Discouraged by a jealous husband as she ranged from Richard Strauss to Arnold Schoenberg and was among the luminaries of her time”³² Even as audiences hear her music, some prefer to perpetuate stories, diagnose, or sexualize Alma Mahler.

Data scraping YouTube revealed that Lieder are performed in a variety of venues, from private practice rooms to commercially released recordings. The diversity of performers and performances on YouTube is a profound advantage, especially as those studying classical music seek to identify and celebrate more diverse representation among performers and composers. YouTube should not be understood as accurately or comprehensively representing the state of Lieder performance. Nonetheless, investigating YouTube content and its metadata provides insight into the classical music being studied and performed by diverse musicians, especially those in the global North.³³ Because fewer classical music albums are being released relative to

³¹ Alma Mahler - Four Songs for Soprano and Orchestra (1915) [Score-Video], accessed 25 February 2022, https://www.youtube.com/watch?v=t_SOI90-35g.

³² Alma Mahler - Four Songs for Soprano and Orchestra (1915) [Score-Video], accessed 25 February 2022, https://www.youtube.com/watch?v=t_SOI90-35g.

³³ According to Pew Research Center's Internet & American Life Project, YouTube is among the most used social media sites among Americans. “Social Media Use in 2018,” accessed 10 November 2020, <https://www.pewresearch.org/internet/2018/03/01/social-media-use-in-2018/>; SimilarWeb reports that the United States (21%) leads in traffic to YouTube, followed by Russia (6%), Brazil and India (4%), accessed 25 February 2022, <https://www.similarweb.com/website/youtube.com/#geography>.

previous decades, the reception of music in the twenty-first century should seriously consider content sharing platforms such as YouTube.³⁴

By investigating both the formally produced and the casually shared recordings of Alma Mahler songs in this example, we have more information about performers and audience engagement. My analysis of Alma Mahler's Lieder in YouTube suggested that performance of her work has the power to "disrupt the fetishized image of Mahler as *femme fatale* and establish her as a composer worthy of our attention."³⁵ Access to YouTube's large corpus of recordings and metadata provides music scholars with rich, user-generated data and affords them with opportunities for future reception studies. The analysis of these data complements more traditional musicological methods and supports a more holistic understanding of contemporary music performance.

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³⁴ Carboni discusses how some labels can rely on significant back catalogues rather than new releases for their income; Marius Carboni, "Evolving Business Models in the Classical Record Industry," *The Classical Music Industry* ed. Chris Dromey, Julia Haferkorn (New York: Routledge, 2018).

³⁵ Rachel E. Scott, "Taking Her at Her Work: Reconsidering the Legacy of Alma Mahler" (Ph.D. diss., University of Memphis, 2021), <https://ir.library.illinoisstate.edu/fpml/136/>, at 176.