RESEARCH ARTICLE

Algorithmic Alchemy: *The Power of the Witch* on YouTube

Hantian Zhang, Yulia Belinskaya, Diane A. Rodgers, & Joan Ramon Rodriguez-Amat

Abstract

This article explores the implications of the algorithmic representations of videos recommended by YouTube. The analysis is based on the mix of computational and qualitative explorations of an automated network of videos. The network was built around a seed video, a recording of a BBC television documentary broadcast in 1971: *The Power of the Witch*. This interdisciplinary article brings together contemporary witchcraft studies, digital studies around YouTube communities, and research on algorithmic inequalities. The authors explore which socially constructed ideas about witchcraft are echoed by the algorithmic artefact that forms the links between the clusters of videos within the network.

Introduction

> *1 Witch.* Round about the cauldron go;
> In the poison'd entrails throw. –
> Toad, that under cold stone,
> Days and nights has thirty-one
> Swelter'd venom sleeping got,
> Boil thou first i' the charmed pot.
> *All.* Double, double toil and trouble;
> Fire burn, and cauldron bubble.
>
> (*Macbeth*, act 4, scene 1, lines 4-11; Shakespeare 1843, 44-45)

The concept of the witch became prominent in early modern Europe, particularly during the period of great persecutions of the sixteenth and seventeenth centuries, as a projected negative shape of the undesirable: a monster or a rebel. While the witch-hunts targeted a significant number of men, the majority of those prosecuted were women, which greatly

diminished their power and control over their own lives and bodies, paving the way for the development of more oppressive patriarchal regimes. The persecution of women was not only a product of religious and social forces; it also reflected broader economic and political structures. Thus, the figure of the witch was not and still cannot be seen solely as a person accused of a particular crime, but also a symbol of resistance to the imposed roles of women within a patriarchal and capitalist framework. Silvia Federici situates the witch-hunts within the larger framework of capitalist accumulation and colonialism, arguing that the persecution of women during this period played as significant a role in shaping Europe's socio-political landscape as did the processes of colonization and capitalism (Federici 2004, 12). Witchcraft, in its modern form, we—the authors—understand as a practice and a belief system that rejects patriarchal domination, offering an alternative vision of autonomy and resistance that contrasts sharply with the exploitative structures of late-stage capitalism, including those manifesting in platform labour and data capitalism.

Modern capitalist systems have evolved drastically since earlier post-medieval times, yet they continue to reflect many of the repressive dynamics of their predecessors. In a globalized and 'platformized' society (Van Dijck, Poell, and De Waal 2018), where digital platforms create and dictate the rules of various aspects of social, economic, and cultural life, colonialism and gender inequality have been reconfigured through new communication infrastructures, access to resources, and the exploitation of data (Couldry and Mejias 2019; Milan and Treré 2019). Witchcraft, as both a historical practice and a symbolic form of resistance, can now also be seen as a response to these contemporary tensions. It reflects a reaction to the ongoing forces of colonialism, gender discrimination, and the soulless capitalism that manifests in platform labour (work that is mediated through digital platforms; Van Doorn 2017), and data-surveillance capitalism. The latter refers to how companies—especially tech giants like Google, Facebook, and Amazon—profit by surveilling users and using their data to manipulate behaviour and predict future actions (Zuboff 2019). In this way, by challenging these practices, modern witchcraft serves not only as a historical echo but also as a reclaiming of power and autonomy against the exploitative systems that still dominate our world today.

In much the same way that historical systems of persecution served to discipline and control marginalized bodies and knowledges, contemporary systems of control and decision-making, like the algorithms governing digital platforms, function as mechanisms that shape and manipulate behaviours. These algorithms, although often presented as neutral tools, reflect and reinforce the same capitalist and colonial dynamics of exploitation. The term 'algorithm' is inherently broad and often ambiguous, describing a whole range of concepts and computational logics (De Seta 2024). In this study, we conceptualize YouTube algorithms as

'form[s] of mechanical decision-making' (Bishop 2018, 69) that continuously refine themselves through autonomous machine learning, identifying patterns in user behaviour and reinforcing connections between watched and suggested videos (Bryant 2020) to favour a market economy. Beyond this, we recognize algorithms as active participants in communication processes, shaping both consumed and created content without users' awareness (Flinterud 2023, 440). For folklorists studying cultural expressions in connective cultures, it is crucial to acknowledge and incorporate these mechanisms into analyses, as algorithms nowadays play a fundamental role in cultural production (Flinterud 2023; Blank 2009). Revisiting how witchcraft is today algorithmically constructed, across the YouTube recommendation systems, is a double way to contribute to the understanding of an algorithmic society (Schuilenburg and Peeters 2021) that 'believes' in algorithmic alchemy—a perceived mystique and opacity of algorithmic processes—and simultaneously to understand algorithms as designed products and producers of ideological frames of inequality.

Thousands of practitioners of witchcraft still exist today (Davies and De Blécourt 2004), and modern witchcraft continues to serve as a form of spiritual and social resistance. The twentieth and the early twenty-first centuries have created numerous popular culture products across the media, extending from literature, video games, comics, and graphic novels, to, of course, movies and television series (e.g. *Charmed* [1998-2006]; *Sabrina the Teenage Witch* [1996-2003]; *Buffy the Vampire Slayer* [1997-2003], or *The Witcher* [2019–present] with its first novel *The Last Wish* by Andrzej Sapkowski [2021]), that have stirred up an interest in witchcraft studies (Willumsen 2022). The trend has also reached numerous recent YouTube videos with witch-related content that have captured new audiences and capitalized on those audiences' fascination with the weird and the supernatural, turning witchcraft into a prominent subject across various disciplines, including not only anthropology, history, folklore, and religious studies, but now also communications and the broader social sciences.

The academic discussion about algorithms and their interaction with the cultural layers of society leads to the question that activates the current project. If algorithms are embedded (and play a role) in the reproduction of cultural production, to what extent might their recommendation systems be a product of and produce meanings woven into the social and cultural fabric? To investigate this phenomenon, we have defined the following two-part research question: Which representations of witchcraft do the (algorithmically-generated) YouTube recommendations construct, and what social and ideological implications do these portrayals evoke?

Specifically, this article takes a rare television documentary as a unique entry point to explore the network of other audiovisual cultural products identified as close or similar to the documentary by the YouTube algorithm. *The Power of the Witch* (1971) is a television

documentary broadcast only once on BBC television, serving as a 'seed' video (V1) to track the algorithmically generated recommendation network of 4,119 videos emerging from it. The mathematical modular analysis of the network nodes generated a series of clusters that, intentionally or accidentally, spread the extension of related social and cultural meanings. We further analyzed these clusters based on the data content and emerging narratives with the aim of clarifying the connections between the clusters, and between the clusters and the seed video. From this analysis, we identified a constellation of meanings derived from the interpretation of the clusters, which reflect the sources and antecedents feeding the algorithm. We interpret these algorithmic outputs not as neutral, but as social-cultural constructions that inform a discourse that is ideologically shaped as an understanding of witchcraft.

This interdisciplinary study integrates research from witchcraft studies with analyses of digital platform communities and of the role of algorithmic systems in shaping cultural inequalities. We examine the relationship between algorithmic recommendation and sociocultural context, combining computational and interpretive methods in folklore studies (Blank 2009; Tangherlini 2016) and social sciences, particularly in the areas of cultural sociology and media studies (Lindgren 2022). Approaching YouTube as a self-organized folklore archive with unrestricted access (Tangherlini 2016), this article maps and interprets a network created by YouTube's recommendation algorithm. Guided by the main research question set out above, we asked the following subquestions:

- (RQ1) What recommendations network emerges from the seed video and how does it relate to witchcraft?
- (RQ2) How is the emerging network organized and what are the 'meanings' of the main features of the clusters (modality) forming it?
- (RQ3) What ideological repertories and socio-cultural implications of the constellations of meanings emerge from the clusters of the recommendation network?

The article starts by investigating witchcraft from diverse angles, revisiting the witchcraft discourses within the fields of folklore studies and digital culture studies. It also examines recent studies and debates on the mediatization of witchcraft, followed by a discussion of social media algorithms and platform communities. In the 'Results' section, we present each generated cluster and contextualize its meaning. This leads into a discussion of how YouTube's algorithm reflects and reinforces particular ideological representations of the witch—what we refer to as algorithmic ideologies of the witch. By this, we mean the ways in which algorithmic systems help construct, prioritize, and circulate specific images, values, and narratives about witchcraft that align with broader cultural, commercial, or political interests.

Witchcraft Today: Folklore and Mediatization Studies, Feminism and Postcolonialism

Social and cultural representations of witchcraft and pagan practices have been challenged in recent decades by both scholarship and popular culture: there is a 'whole range of misconceptions, and arguably misappropriations, of concepts of history, nation, "race" and ethnicity which seem to exist within popular pagan lore' (Gallagher 2012, 577). Silvia Federici speaks about the figure of the witch, who 'in *The Tempest* is confined to a remote background, in this volume is placed at the center-stage, as the embodiment of a world of female subjects that capitalism had to destroy: the heretic, the healer, the disobedient wife, the woman who dared to live alone' (2004, 11). More recently, Chloe Germaine Buckley refers to 'the witch . . . often praised as a feminist figure, who pushes boundaries, breaks the rules, and punishes patriarchal authority' (2017, para. 3). Laurel Zwissler underlines how throughout history the 'Satanic witch' was overwhelmingly represented as female and how modern horror films are capitalizing on female sexuality (2018). Traditional notions of the witch, in popular culture at least, function as a warning to women, who may face punishment 'for attempting to exert power outside the bounds of the domestic sphere' (Buckley 2017, para. 2).

At the same time, feminist scholarship typically regards witchcraft as a means to combat patriarchy (Klassen 2004), as standing in opposition to traditional religions that often perpetuate patriarchal structures. In this context, witchcraft is seen as legitimizing female authority (Bever 2002) and functioning as a form of resistance and empowerment. Many of these writings have also been criticized for 'their neocolonial appropriation of Black, Indigenous, and People of Color's spiritual practices, deities, and symbols' (Scheurich 2022, iii). Furthermore, popular culture discourses have intensified the intersectional gap by either appropriating or 'whitewashing' issues like racism or pagan culture. In this sense, what persists in modern representations of witchcraft is not only the image of the witch as essentially female, but also typically portrayed as white (or green, on occasion).

This has been supported by Anglo-American and European cultural imaginaries for centuries, although popular culture narratives about witchcraft frequently draw from non-white and non-Christian practices. This is what Mikel Koven discusses in relation to racism and cultural appropriation as directly addressed by Jordan Peele's 2017 film *Get Out*, which highlights a long history of cultural misconceptions in the horror genre (Koven 2019). The 'whitewashing' of witchcraft and pagan culture, alongside overt ties to feminism and female empowerment, are at the forefront of problematic issues that are being challenged (White 2019). While it is true that some contemporary Pagan traditions, such as Wicca, self-identify as

witches and claim the heritage of witchcraft, other traditions, such as certain branches of Heathenry or Druidry, do not see their magical practices as witchcraft. This distinction is important, as some may find the equation of all Pagan practices with witchcraft objectionable. Similarly, another strand of the debate on witchcraft, which is internationally relevant, is the very concept of the witch-hunt, in both historical and contemporary contexts, as the notion continues to have social and political resonances today (Gaskill 2008, 1087).

From a folklore studies perspective (for instance, Simpson 1994), modern pagan witchcraft is generally understood as a far less 'ancient' phenomenon than James Frazer (1890) and Margaret Murray (1921) had proposed. Witchcraft is studied today as a much broader concept and from a diversity of perspectives, rethinking its history alongside the important race and gender issues outlined above (Hutton 1999). As historian Malcolm Gaskill remarks,

> Twenty first-century studies [of witchcraft] encompass every conceivable chronological and geographical area, from antiquity to the present, Massachusetts to Muscovy. Approaches have been varied, with witchcraft explored as an intellectual, legal, political, social, cultural, and psychological phenomenon. (Gaskill 2008, 1069)

Indeed, contemporary folklore research increasingly focuses on how beliefs and perceptions about witchcraft are perpetuated and enacted online, and which political and ideological implications arise from such online dialogues. Diane Rodgers builds on the works of Linda Dégh and Andrew Vázsony (1983), Bill Ellis (1989), and Mikel Koven (2008) to explore how media texts encourage debates over a legend's veracity, influencing future content creation and how this, in turn, influences future generations of content creators and popular beliefs about folklore (Rodgers 2019). When folkloric content is created and shared within the media-rich digital realm, ostension as online social activity enables the emergence of a meta-discourse 'on the nature of legends but also on the nature of the ostensive practices themselves' (Peck 2015, 16).

Although witchcraft traditionally emphasized materiality and ritual, its transmission increasingly occurs through digital media (Figueroa and Ruffin 2018): 'folklore isn't limited to orality' and the Internet 'does not diminish the potency of folklore; instead it acts as a folkloric conduit' (Blank 2009, 6-7). Indeed, modern digital technology has provided dispersed witchcraft communities with organizational opportunities to overcome geographical barriers, offering a public space for discussion and easing access to media texts 'for seekers in rural or socially-conservative areas' (Aloi 2009, 543). Simultaneously, technology is not neutral, and it 'can bring the vernacular into sight, thus facilitating community culture and promoting nationalism—traditional byproducts and correlates of folklore' (Blank 2009, 7).

Debates on witchcraft and digital religion (Coco 2008) have deepened understandings of online religious interactions. According to Heidi Campbell (2017), digital religion research 'encompasses topics such as how religious communities engage with the Internet, to ways religiosity is expressed through digital practices and the extent to which technological engagement can be seen as a spiritual enterprise' (16). Neo-pagan mediatization has demonstrated how social media platforms like Facebook facilitate new community structures (Renser and Tiidenberg 2020), transforming traditional ritual practices. For example, studies of Estonian witches on Facebook and Messenger reveal power dynamics within these digital groups. Related research explores intersections of nationality, belief (Schram 2010), and practical applications of witchcraft, including herbalism and charms (Houlbrook 2018). The digital extension of witchcraft and its related research fields reaches the tools and methodologies that capture cultural activity online. This is what the work by Douglas Ezzy and Helen Berger (2009) did when they captured a slight decrease in Google searches for witchcraft between 2004 and 2008, as opposed to the growing and steady interest revealed in Google trends between 2008 and 2020 where witchcraft saw slight increases from May 2019 (peaking in several African countries: Zambia, Zimbabwe, Uganda, Kenya, Ghana). Some peaks could be associated with video game releases (*Fallout* 2015, 2018), movies (*Season of the Witch* 2011), songs, manga, and other popular culture artefacts. This does not come as a surprise, as Berit Renser and Katrin Tiidenberg note: 'books, magazines, and TV have historically been significant in popularizing Paganism' (2020, 1). Their article speaks about research that merges computational methods and digital research tools to explore cultural phenomena, including the presence of popular culture mythologies intervening in and shaping the algorithmic representations of witchcraft on YouTube. This process contributes to the platform-mediated ostension and its shaping of the framing of folklore, and with its beliefs, behaviours, and practices.

YouTube Algorithms, Community, Technology

Social media platforms rely on algorithms to curate content, thus shaping information flows (Gillespie 2013). These automated processes of sorting online information add to the illusion that algorithms grant forms of authority, accuracy, and objectivity; a 'carefully crafted fiction' (Gillespie 2013, 179) criticized at length by scholars who move beyond the specific technical features of the algorithms to focus on how people engage with them and how they interact with social and cultural life. Critical algorithm studies has now become a significant field within the humanities and social sciences (Gillespie and Seaver 2016). It spreads along six strands: algorithm overviews, the implications of algorithms, ideological effects, technical nature, human design, and methodologies for study (see Van der Nagel 2018).

This social and cultural research on algorithms has led to the notion of 'algorithmic culture', meaning the use of computational processes to sort, classify, and hierarchize people, places, objects, and ideas, and also the habits of thought, conduct, and expression that arise in relationship to those processes (Hallinan and Striphas 2014, 119). These uses and practices also involve beliefs and values, mental models, and complex ideological mythologies that link algorithms, their work, their possibilities, and their presence in society. Research has shown that 'the stories that people tell about algorithms particularly reveal themselves in moments of disruption, surprise, and breakdown' (Bucher 2016, 91). It has also shown that since 'YouTube occupies a central role in the media life of teens' (Pires, Masanet, and Scolari 2019) and is less hierarchical than Facebook groups, YouTube appears to be a more inclusive platform. However, the same apparently random but objective algorithmic representation, both on YouTube and Facebook, shapes the notions not only of practitioners of witchcraft and participants in related online communities, but also a wider user network who may find the witchcraft-related media content 'by accident' (Burgess and Green 2018). This serendipitous visibility of videos adds to the beliefs around algorithms, forming vernacular expressions and communicating emergent folkloric traditions or what Trevor Blank calls the 'folkloric conduit' (2009, 7), Sophie Bishop calls 'gossip' (2019), and Zoë Glatt refers to as 'an omnipotent God, a black box to be opened, a mystery to be solved, a voracious machine, and an oppressor of marginalised groups' (2022, 544).

Similarly, the workings of YouTube algorithms that are responsible for filtering searches and making recommendations to users have become one of the most researched topics among digital scholars because of the associated social and political implications. According to Sophie Bishop, YouTube deliberately structures video recommendations by actively suppressing content that lacks commercial value, punishing the creators with non-visibility and reshaping the content structure (2018). This mechanism of control parallels the concept of 'symbolic violence', which refers to a form of coercion exerted on social agents with their own implicit participation (Bourdieu et al. 2004). The technical side of the ranking algorithm is kept secret by companies such as Google because the purpose of their business model is to monetize the creative work of users. Algorithms are aimed at personalizing the experience, which creates a potentially problematic narrowed list of recommendations. Google uses the popularity principle, consistently featuring certain videos of more popular uploaders (Pietrobruno 2018, 528). This leads to debates around cultural homogeneity and around the quality of 'the public sphere and democratic opinion-forming processes' (Schmitt et al. 2018, 784-85).

The algorithmically defined hierarchical structures of the advanced YouTube recommendation system and their commercial nature have been heavily criticized by scholars

for ‘radicalising young people and steering viewers down rabbit holes of disturbing content’ (Matamoros-Fernandez and Gray 2019, 2). YouTube has addressed these criticisms by moderating disturbing content. However, ‘Once accessing extremist content via YouTube, users are likely to be redirected to further extremist videos’ (Schmitt et al. 2018, 782), and studies indicate that forty percent of younger users (aged fourteen to nineteen) have encountered extremism on the platform (Schmitt et al. 2018, 781). Furthermore, due to the nature of the platform, YouTube allows participation not only in terms of posting and watching but also as social interaction (Shao 2009). YouTube both disseminates information and fosters social interactions (Shao 2009), making it a repository for ideological content (Conway and McInerney 2008, 108) and facilitating the networking of potentially radicalizable elements.

Participation on platforms can also address positive social integrative needs, which encompass connecting with ‘family, friends and the world’ (Katz et al. 1973, 167) and growing personal integrative needs such as credibility and confidence. This again recalls Trevor Blank’s work on Internet lore in which he identifies emergent traditions ‘being forged in online communities’ (2009, 9) and what Andrew Peck describes as ‘a *culture of sharing*’ that encourages ‘ongoing reciprocal interactions’ (2015, 19; original italics). As Henry Jenkins argues, ‘Audiences, empowered by these new technologies, occupying a space at the intersection between old and new media, are demanding the right to participate within the culture’ (2006, 24) and, through this participation, to build communities.

Research on algorithms has typically aligned with this dual perspective: they are both stories that people tell, which confer value and authority (Belinskaya 2021; Gindin, Cingolani, and Rodriguez-Amat 2021), and technological architectures that structure and hierarchize platform content. These perspectives have shaped the main strands of conceptual debate surrounding algorithmic influence and control. The first strand of the research looks for social and cultural understandings by means of anthropological approaches and digital ethnography through online observation (Pink et al. 2016 and 2022; Hine 2015). It tries to capture the meanings of algorithms in the social contexts of platformized creative work (Glatt 2022) and of both aspirational influencers and ordinary users’ everyday lives (Wilson 2019). The second strand explores and creates computational tools (Van Atteveldt et al. 2022), or digital methods (Rogers 2013) to dive deeper into the mechanical features of the algorithms and their social implications. Between these two main approaches, the new boost in social network theory approaches (Wasserman and Faust 1994) gains more significance by blending quantitative and qualitative approaches to study digital interactions (Scott 2017). Furthermore, our project pays specific attention to the relational nature of the links between the seed video V1 and the recommended videos provided by the algorithm.

Still, our contribution here is mostly epistemological: the article is driven by the tension and complementarity between interpretive and computational analysis. This is a fruitful strand of research that is emerging, as described by works that recommend 'an iterative, alternating model for switching between machine and human, and between data and theory, in a structured approach for how data (science) and (social) theory can be incorporated in empirical research' (Lindgren 2020, 144; Atteneder and Rodriguez-Amat). Similarly, Tangherlini (2016, 5) calls for a dialogic and mutually enriching integration of computational methods and humanistic inquiry within folklore studies. This article aligns with these approaches and contributes to building a bridge between the social sciences and the humanities—including folkloristics—and computational methods, because:

> in this age of big folklore, we must recognize that computational approaches can help make sense of the often hidden patterns that characterize human expressive culture at scale, alert us to research questions of which we may have been unaware, and provide us with tools to tackle research questions that previously may have seemed intractable. (Tangherlini 2016, 10-11)

Methodology

The Power of the Witch (V1) is an extremely rare BBC television documentary, broadcast only once on BBC Two in the United Kingdom on 15 December 1971 at 10:40 pm and never officially rebroadcast or released on physical or streaming platforms. At the time of writing, only these three uploads have been identified on YouTube (see Table 1). The first video was used as a seed because it is also the one with a higher number of views.

Table 1. Available uploads of the video V1

	User	Videos about	Number of subscribers	Number of views	Date of posting
V1	Metanoia	Magic and witchcraft	109,000	290,592 views	6 June 2012
	TV Time Capsule	Obscure film and television from the 1970s and 80s including horror, mystery, and thriller genres	155,000	1,998 views	18 September 2018

	dell mack	Miscellaneous videos including rarities, viral videos, and animations	389,000	13, 905 views	23 June 2017

The Power of the Witch is a relevant and interesting example for three reasons: first, it is an example of mainstream media indicative of the era of its production. The documentary treats the subject matter with solemnity and lack of sensationalism as befits the British Broadcasting Corporation. Second, the documentary is a good example of the aforementioned community dimension of collective fascination with 'witchcraft' or 'magic' in a broader sense. Such communities are looking back to earlier periods for reference while being able to take into account more recent global cultural productions (such as the Netflix series *The Witcher*). And third, because in spite of its historical and dialogical relevance, *The Power of the Witch*, as a rare video with few uploads, offers a clean and solid methodological starting point for data collection.

To achieve the aims defined for this project, the methodological plan distinguishes two stages: (a) data collection that consists of acquiring the videos that form the recommendation network of the seed video; and (b) data analysis that combines software resources to develop a quantitative, network, and qualitative-interpretive analysis to examine the logic behind the organization of YouTube's recommendation algorithm. These mixed analyses identify the traits of the videos forming each cluster, answering the main research question about the representations of witchcraft spread across the network of clustered videos, by answering, one after the other, the three sub-questions (RQ1, RQ2, RQ3).

The YouTube Data Tool developed by Bernhard Rieder (computer software, version 1, 2015) enabled the collection of the algorithmically generated recommendation network of videos starting from our original seed (V1). The total collection of videos expands as a network of items in contact with each other. From the seed video, with the crawl depth of two (i.e. how many links on the networked chain of videos the software is asked to define), the tool first returns data about all videos related to V1, and then returns data about further videos linked to those gathered in the first round. The YouTube Data Tool identified a total of 4,119 videos (retrieval date 10 June 2020), and provided the video's metadata including view count, like count, and number of connections. A second round of data collection retrieved the number of subscribers to each channel to which the video was uploaded.

The data obtained was processed as a network (using Gephi software) to identify and visualize the clusters forming the network. The network analysis starts treating the videos as nodes, while their algorithmically generated recommendation links appear as connections (edges or lines). The network can then be visualized, and a modularity algorithm can be

calculated on the network to mathematically assess the probability strengths of those connections and capture the organization of the network into modules (communities or clusters). A higher density of connections between nodes within the same module helps to identify videos that are more closely linked together. The network of 4,119 videos obtained was then classified into ten clusters and each cluster was graphically represented in different colours (see Figure 1, left). That visualized network incorporated other variables such as the most viewed videos in each cluster (the node size, bigger for more views). This initial quantitative (RQ1) and network analysis (RQ2) of the video collection helped identify the most viewed channels, the number of videos per cluster published per year, the maximum, minimum, and average view counts per cluster, as well as the subscriber numbers per cluster, and the social activity shown in each cluster (Figure 2).

Figure 1. Left: Differentiated clusters in the network of 4,119 videos obtained with YouTube Data Tool. Each dot is a video, the dot size indicating the relevance of the video for the network (connection degree). The distance between dots shows the strength of the relationship between them. Right: The number of videos per cluster.

Parallel to the visualization of the data, we have interpreted each one of the clusters qualitatively (RQ3) with the purpose of identifying similarities between videos in each cluster and differences with videos belonging to other clusters. This operation of categorizing the clusters helped us understand clusterization in terms of topics and identification criteria, providing a cultural embedding to the mathematical clustering. For videos with non-English titles (e.g. Polish, Thai, Arabic), we used Google Translate.

The Findings section below follows the process of analysis, starting with a description of the network and the clusters. The description builds towards the next sections, on the features of the kinds of witchcraft this recommendation network shows. For many of the statements of the findings, we provide examples by giving a number to the video illustrated (Vn, where n is the number of the video in Table 2, in the Appendix).

Findings

Networked Witchcraft

The list of 4,119 videos appears as a dispersed combination of videos that in principle are not easily organized. However, a mathematical analysis of the visualization produced by the software Gephi shows that the network of videos is ultimately organized in clusters (see Figure 1, right). Each one of these clusters has been obtained using Gephi's modularity algorithm as defined by Vincent Blondel et al. (2008). The names of clusters and distribution of videos within the clusters are represented by Figure 1. Following Airoldi, Beraldo, and Gandini (2016)

the cluster names and descriptions presented only provide reference to the core video contents of the elements in each cluster. These names and descriptions are based on a non-exhaustive analysis and observation. Therefore, the names should not be considered as representative of every video in each cluster. The graphic representation of each cluster includes the network (left side of the figure) and the identification of the videos with more views.

Figure 2a shows the visualized networks for Cluster 0 (1,181 videos), with the most viewed videos displayed on the top right, and Cluster 1 (102 videos), with the most viewed videos shown on the bottom right.

Figure 2. Visualized networks of (a) Cluster 0 (top) and Cluster 1 (bottom); (b) Cluster 2 (top) and Cluster 3 (bottom); (c) Cluster 4 (top) and Cluster 5 (bottom); (d) Cluster 6 (top) and Cluster 7 (bottom); (e) Cluster 8 (top) and Cluster 9 (bottom).

Cluster 0: Everything Witchcraft

Cluster 0 is the biggest cluster with most videos directly connected to the notion of witchcraft. The typology of videos in cluster 0 includes:

- documentaries or films about witchcraft, including topics such as Wicca and Paganism (V12, see Appendix) and National Geographic's *Black Magic* (V13);
- educational videos explaining witchcraft (V14);
- recordings of interviews or footage of people talking about witchcraft (V15) and witchcraft rituals (V16);
- reviews of books about witchcraft (V17, V18);
- music related to witchcraft (V19);
- witchcraft communities and any content made by individuals such as 'witches in practice' offering DIY witchcraft such as spell-casting or curse-breaking (V20, V21);
- videos about witchcraft locations such as museums and towns (V22, V23);
- news reports about witches (V24);
- lecture recordings about witchcraft (V25);
- witch-trials such as the famous seventeenth-century Pendle trials (V26);
- religion-related videos not necessarily about witchcraft (V27).

The most watched video of this cluster is a K-pop video with over a billion views (V2) by Blackpink, a Korean group with over fifty million subscribers, and it belongs to the last cluster with miscellaneous outliers (V28 is another example).

Cluster 1: Polish Production

Cluster 1 mainly contains videos from Polish Youtubers. The most viewed of them is a music video with four million subscribers (V3), part of '#Hot16Challenge2' used in April 2020 to raise money for health workers during the pandemic. This cluster also includes comedy, vlogs, and gaming videos (V29). Most of them are not directly related to witchcraft, except a comedy video about UFOs (V30). Besides Polish YouTube videos, this cluster also includes lectures about Early Modern England from Yale University (V31).

Cluster 2: Horror and Mysteries

Figure 2b shows the visualized networks for Cluster 2 (254 videos), with the most viewed videos displayed on the top right, and Cluster 3 (511 videos), with the most viewed videos shown on the bottom right.

Some of these videos link closely to witchcraft, but only in terms of a link with fear and horror (V32, V33). The cluster is further populated with videos about ghostly and paranormal activities (V34), monsters and creatures (V35, V36), mysteries (V37), stories about haunted objects and locations (V38), and creepy online videos (V39). With above twenty million views, a ghost-hunting video on one of the popular Buzzfeed channels investigates three 'horrifying cases of ghosts and demons' (V4).

Cluster 3: People and Events

These videos refer to specific people and their lives, histories, and events; for example, historical figures such as Andrew Jackson and the Rockefellers (V40, V41) and general histories such as Britain and the British royal family (V42, V43). The most viewed video in this cluster is a Channel 4 production about Diana, Princess of Wales (V5), with more than ten million views, on a channel dedicated to Lady Diana with 29,000 subscribers.

There are videos about the worst occupations of the past (V44), past technologies (V48), and architecture (V49). Some videos focus on destructive events, including World War II, the Nazi regime, or plagues (V45, V46, V47). Only a few videos are related to witchcraft, mentioning witch-trials (V50). Some of these videos appear across several clusters as they include stories about ghosts (Cluster 2) or crimes (Cluster 5).

Cluster 4: Humanity and Society

Figure 2c shows the visualized networks for Cluster 4 (561 videos), with the most viewed videos displayed on the top right, and Cluster 5 (418 videos), with the most viewed videos shown on the bottom right.

The second largest cluster involves representations of humanity and society with high-quality production value, meaning content that is professionally produced or involves some investment in production. The topics include:

- voodoo and witches (V51);
- life in 'exotic' locations including Africa, Romania, and North Korea (V52);
- gender-related topics including bride kidnapping (V53), sex trafficking (V54), places ruled by women (V55), transgenderism in Thailand (V56);
- racial issues in South Africa (V57), slavery (V58), recent protests against racism and #blacklivesmatter (V59);
- children, including child abuse (V60), child prostitution (V61), and starvation (V62);
- historical figures such as Karl Marx (V63), or UK reality TV debt-collector Shaun Smith (V64);
- human trafficking (V65), mass shootings (V66), and war (V67).

Some other miscellaneous video topics include technology (V68) and news reports (V69). The most viewed video in this cluster is a documentary by *Vice* Magazine with over thirty million views (V6) from a channel with over thirteen million subscribers.

Cluster 5: Crimes, Cults, and Health

This cluster includes videos about: kidnappers and serial killers (V70); medical videos and drug trials; people with unusual medical conditions, and witches' brews (V71). There are also videos about cults (V72), plus videos linked to Cluster 4 involving poor children and social experiments (V73). With twenty-nine million views, the most viewed in this cluster is Channel 4 documentary *Ohio Slave Girls* about the kidnapping of three girls held in captivity for ten years (V7).

Cluster 6: Mind and Philosophy

Figure 2d shows the visualized networks for Cluster 6 (124 videos), with the most viewed videos displayed on the top right, and Cluster 7 (355 videos) with the most viewed videos shown on the bottom right.

In this cluster, videos connect Taoist and other Asian religions (V74). There are also videos about Western philosophers in general, such as Plato (V75), and audio-readings of philosophy books (V76). Videos on meditation connect these ideas, including topics such as reaching the 'flow state' and 'awakening' (V78), and meditation music (V77). Among those, with ten million views, and from a channel with more than three million subscribers, the most viewed video of the cluster is one with meditation music (V8).

Cluster 7: Thai Productions

This cluster, in the margins of the video network, is composed of videos from Thai YouTubers, mostly in the Thai language. There are large groupings of gaming videos (V79), travel vlogs, and some Thai horror games that relate to ghosts in Thai folklore (V80). The most viewed video of this cluster is a travel entertainment video with more than eleven million views, produced by VRZO, a famous YouTube channel in Thailand with over 6.5 million subscribers (V9).

Cluster 8: Media Production

Figure 2e shows the visualized networks for Cluster 8 (161 videos), with the most viewed videos displayed on the top right, and Cluster 9 (452 videos), with the most viewed videos shown on the bottom right.

This cluster contains videos connected with media products and craft: books, films, and video games. For instance, videos relating to Dennis Wheatley novels (*To the Devil a Daughter*, 1976) (V81), the work of Alexandre Dumas (*The Count of Monte Cristo*, 1844) (V84), and Christopher Lee (V82, V83), star of many horror films including *The Wicker Man* (1973) and *Dracula* (1958). A subgroup of videos about video games includes *Minecraft* (V85), *Player Unknown's Battlegrounds* (PUBG), *Roblox*, *Scrap Mechanic*, and *League of Legends*. Among these, the most watched (with eleven million views) is a walkthrough of the horror game *The House 2* (V10) by Pewdiepie, who is now a world-famous YouTuber with more than 107 million subscribers. The rest of the videos in this cluster include challenges like building IKEA furniture (V86).

Cluster 9: Civilizations

Cluster 9 includes videos on ancient history and archaeology, including Egypt, Sumer, and the Mayan civilization (V87); plus ancient texts such as *The Emerald Tablets of Thoth* (V88). Another group of videos is about science and modern versus ancient technologies (V89), UFOs, aliens, and exploring other planets (V90). The cluster also contains videos about death, the afterlife, and near-death experiences (V91). The most viewed video in the cluster, with thirty million views, is about the most dangerous airports in the world (V11) by the channel World Top ONE with 489,000 subscribers.

Descriptive Analysis

To better understand the criteria for the recommendation, it is worth looking at the year of publication of the 4,119 videos (Figure 3, bottom). As the chart shows, most of the videos appear to have been uploaded recently (at the time of writing): almost a quarter in 2020, and more than half in 2018 or later. This indicates, as noted in other research (Rodriguez-Amat and Belinskaya 2021) that social media algorithms prefer to recommend recently posted material. This is, however, not true for all clusters. For instance, material in Cluster 0 is much more consistent across the years since 2011 (from 66 videos in 2015, to 158 videos in 2018).

Figure 3. Top left: Numbers of videos in each cluster within a channel within a specific range of subscriber numbers in four tiers (Tier 4 = 100K+, Tier 3= 10k-100k, Tier 2= 1k-10k, Tier 1= <1k). Bottom left: Number of videos posted per year and per cluster. Top right: User activity in each cluster, mainly commenting and liking. The maximum likes/dislikes and maximum comments that all videos in each cluster get in total. Bottom right: Maximum views of all videos in each cluster and the average and minimum numbers of views for each cluster.

A second fundamental issue affecting the YouTube algorithm in relation to its recommendations are the channels from which videos are uploaded. While the discussion of the clusters forms the centre of this exploration about witchcraft and the recommendation algorithm, it is still useful to observe the channels which host the videos. Some of those channels appear more than once and the recommendations algorithm seems to consider some channels more relevant than others (Figure 4).

Figure 4. The most active channels (only those with more than twenty videos in the sample).

The first four channels contribute 337 videos (nearly ten percent of the full network), all categorized as documentaries, aligning with the seed video. However, these videos appear in different clusters. The DocSpot channel, created in 2017 with 348,000 subscribers, has ninety-five videos, mostly in Cluster 3 (with a few in Clusters 2 and 9). Timeline–World History Documentation contributes ninety-one videos, primarily in Cluster 3 (eighty-three videos), with others in Clusters 5, 2, and 1. The third channel, Real Stories, has seventy-nine videos, most of which are in Cluster 5 (sixty-six videos). As Rieder, Coromina, and Matamoros-Fernandez (2020) highlight, YouTube's tier system, based on channel subscriber numbers, influences both content organization and monetization. For this study, channels were categorized into four tiers according to the number of subscribers with Tier 1 having below a thousand subscribers (see Figure 3, top left).

The distribution of tiers shows that videos in Tier 4 are the most abundant in each cluster. This suggests that the different clusters are formed by a core of Tier 4 channels, then followed by a very active Cluster 3. This aligns with the aforementioned findings by Rieder, Coromina, and Matamoros-Fernandez (2020). Beyond the most frequently viewed videos in each cluster, it is also worth considering the distance and the average between the maximum and minimum views in each cluster (Figure 3, bottom).

Cluster 0 has the highest total views (860 million), while Cluster 1 has the lowest maximum view count. Despite these variations, average views across clusters remain similar, ranging from 1.8 million (Cluster 4) to 600,000 (Cluster 7).

Figure 3 (top right) also illustrates user engagement (likes, dislikes, and comments) in each cluster. Cluster 0 videos show the highest interaction levels, likely due to their stronger topic alignment, longer online presence, or reduced dependency on monetization-driven algorithmic priorities.

The dispersion of clusters is distinct: they form around cores of activity (Figure 1), with highly viewed videos often in Tier 4 or high-impact positions. The farther a cluster is from Cluster 0, the more its network centres around a specific core. Only Cluster 0 maintains historical consistency, while others primarily contain more recent videos. Many videos in these clusters are prioritized by YouTube's recommendation system for monetization (Rieder, Coromina, and Matamoros-Fernandez 2020). Social activity levels (likes/comments) are generally lower in other clusters compared to Cluster 0, which attracts significant attention.

A Particular Kind of Witchcraft

In order to answer the third research question and to understand the ideological repertories and socio-cultural implications of the constellations of meanings emerging from the clusters, we examined the algorithm's logic within the framework of algorithmic mediation and cultural production, through its computational organization of content. The relationships between these clusters and the cultural meanings they evoke are not naturally given, but rather emerge from the algorithm's computational treatment of digital content. This process, while producing seemingly coherent associations, does not necessarily follow human emotional logic but instead results from an intricate mathematical ordering of information (De Seta 2024). The symbiosis between this algorithmic activity and users' behaviour on the platform create a specific type of vernacular creativity, which is not only mediated, but shaped by automation, or so-called 'algorithmic folklore' (De Seta 2024, 236). Platforms such as YouTube function as sites where folklore is dynamically reshaped by algorithmic interventions, that structure meanings in ways that both reinforce and reconfigure existing cultural narratives.

Thus, the cluster network as a YouTube algorithm artefact does not preclude it from simultaneously being an actual cultural construct. Indeed, the dispersion of topics emerging around the core cluster forms a network of meanings and significations. This network is not a natural, spontaneous, or obvious territory of connections; instead, the network is a cultural landscape reproduced and informed by the mathematical operation of the algorithm.

The arbitrariness of the significant connections between the clusters and the core fundamental seed video, is clearly perceptible in the operations in which the algorithm brings together aspects that only are part of an accidental connection. A good example of this is the 'craft' element that combines IKEA challenges as an act of making and videos about the video game *Minecraft* in Cluster 8. However, *Minecraft* itself not only includes content featuring elements of myth and legend (involving dragons, zombies, skeletons, and so on), but also draws on witchcraft-inspired practices. These include the 'art of making', which aligns with folkloric practice extending from secret potions, ritual, gestures and combinations of actions, and the crafting of amulets. There, the initially improbable semantic link between the seed video and the cluster shows possible culturally constructed links to be considered.

The random connections between clusters also appear graphically represented. In Figure 2a there are two clearly outlying groups of videos corresponding to Clusters 1 (Figure 2a bottom), and 7 (Figure 2d bottom); and yet, these dispersed clusters offer interpretive possibilities. Cluster 1 appears to be little connected with witchcraft, being mostly videos by Polish YouTube vloggers including history lectures and a long history of frightening mythical monsters and legends about witchcraft in Polish and Slavic folklore. These include, for example, the witch Baba Yaga, or the 'Black Volga' as a popular urban legend (in Poland and other countries such as Russia and Ukraine) about a car purportedly driven by Satan which abducts people (Brunvand 2001). But the proper explorations of these references are clear within the popular 2019 Netflix series *The Witcher*, based on the series of fantasy novels by Polish author Andrzej Sapkowski that also inspired a successful Polish-made video game series. This link with *The Witcher* transmedia universe (Mochocka 2018) is another example of how algorithms not only construct meaning and imaginaries, but also feed on existing cultural production to reproduce and enhance its limits.

Cluster 7 shares a similar fate: most of the videos are made by Thai YouTubers and only a few among them include a Thai horror game based on Thai folklore about Pret, a ghost. This seems to be the sole connection with supernatural themes. The exotic imaginaries insist that magical belief is strong in Thailand, with tales of magical cannibalistic spirits such as the 'phii pob . . . malevolent, amorphous spirits related to a distinct category of misfortunes' (Wattanagun 2018, 80). This spirit is commonly characterized as a woman who likes to devour

human viscera, linking with Western notions of the witch, but also connecting with folklore about zombies and voodoo (Eldridge 2017; Creagh 2015).

Indeed, the translation of the algorithmic connection into a cultural interpretation emerges easily enough to consider it a relevant factor. Clusters 2 (horror and mystery), 5 (crimes, cults, and health) and 8 (media and craft production) reproduce a solid line of representation of witchcraft in popular culture products in relation to V1. In this sense, videos about ghost stories, monsters, and the paranormal in Cluster 2 insist on building a link to work by Christopher Lee and Dennis Wheatley, both playing integral roles in the commercial imagination of horror. Furthermore, the popularization of books about folklore and growing commercial appeal of occult ideas led the mainstream press to note already in the 1970s: 'There's money in myths and magic' (*Sunday Telegraph* article cited in Truzzi 1972, 16). Further still, material connecting the seed video to Cluster 5 links thematically with cults and serial killers, extending to devil worship and paranormal activity. *The Haunting of Sharon Tate* of 2019 is such an example: related crimes instigated by the Manson family are often discussed in the same context as Satanic ritual and folklore (Ellis 2003). This criminal theme aligning rituals with serial killing also suggests the link to health (particularly mental health) that is also present throughout Cluster 5. With this chain, the connection of witchcraft to moral panic and mass hysteria becomes more visible.

The destructive historical events contained in Cluster 3 involve war, plagues, and massacre. There are a number of videos about Hitler and the Nazis that approach links to some witch-hunting campaigns that continue to have pressing social and political resonances today in relation to 'paranoia and persecution, religious fundamentalism, international warfare, collapsing empires' (Gaskill 2008, 1087). The Nazis also famously investigated the occult, which again helps to explain the presence of such videos in a cluster stemming from a video about witchcraft (Goddrick-Clarke 1992). This too builds bridges with Cluster 6, which features videos on religion, beliefs, and philosophies (such as Buddhism). Wicca, as a modern reinvention of witchcraft and pagan belief and practice, can also be understood as an alternative religion and connects with the interest in the occult reactivated in hippie culture from the 1960s and 1970s.

The idea of alternative civilizations in Cluster 9 recalls some categories of folk belief and contemporary legends found in both scholarly and popular literature on mythology and folklore: beliefs about the afterlife (including ghosts) and fairies; legends about places (such as prehistoric stone circles, tunnels, and holy wells) and 'modern beliefs' (for example, UFOs, aliens, and Fortean phenomena) (Trubshaw 2002). A revival of interest in texts by James Frazer (1890) and Margaret Murray (1921) helped to promote the notion that witches were members of ancient secret societies, preserving a fertility cult through the ages. While this view has since been widely discredited by academics (Simpson 1994), popular notions about witchcraft

had already taken root. In this sense, there is a particular popular discourse that not only observe the narratives about other worlds and other times, but also pay attention to material elements: standing stones and Neolithic remains, landscapes, visions, traces, ruins, and sightings. These are present not only in Cluster 9, but also in Clusters 3, 4, and 6.

Cluster 4 includes videos about gender, voodoo, and witchcraft in specific communities (in Africa, for example), and perceptions of the exotic in relation to children and race also. These themes are central to many scholarly debates on witchcraft, particularly those exploring cultural identity, power dynamics, and the ways witchcraft is portrayed or interpreted in different contexts.

Algorithmic Ideologies of the Witch

The network of video recommendations obtained from the YouTube Data Tool iterates and extends particular notions of witchcraft and reveals a very complex constellation of meanings associated with witchcraft. Extending the lines drawn by the theoretical strands and interpretations from the video-clusters, several features of witchcraft emerge as culturally relevant attributes: witchcraft and the art of making (e.g. potions); the outskirts of the living, including voodoo, zombies, and terror; the occult and threatening evil, such as the Nazi destruction and collective moral panics; and the cultural spheres of fiction with *The Witcher*-verse, *Harry Potter*, or the Thai terror. The composite emerging idea of witchcraft growing from this conglomerate of meanings is very particular, and clearly not welcoming. This section examines the drivers that might have led to this specific algorithm-generated shape and uses them to identify the ideological principles that inform the discourse of the computational operation behind it.

The documentary nature of *The Power of the Witch* is not what drives the network, nor is the concept of power itself that could easily be drawn from the title. Instead, the strongest interpretive link-generation extends to a network of themes that centre around witchcraft, building a form of highly ideologized 'folkloric conduit' (Blank 2009). Indeed, this network is not politically or ideologically neutral: detailed attention to its features shows that there is an ideological framework shaping the meaning of witchcraft and its pathway to multiple possible thematic strands and meanings within the margins of a moral, political, and rather conservative model. This model extends in at least three clear well-connected directions: productive autonomy and DIY practices, the 'exotic' that includes gender and nature, and moral panics and the threat of evil.

The productive autonomy of the craft in witchcraft, connects the videos about IKEA and *Minecraft* to a core practice that involves the making of DIY potions and remedies. The capacity for self-care that is echoed across some of these videos (including the 'how to' cast a

spell (V20), make a potion, or build a wand) is connected to the understanding of witchcraft as a form of alternative living, apart from the economic world of capitalist consumerism, echoing the discussions developed by Silvia Federici (2004). This principle of making is promoted from the privately-owned platform that claims to enable access and visibility to all cultural-video content creators and grants them an algorithmic fairness to become famous influencers and to monetize their creative activity. By doing this, YouTube shares with witchcraft the same fiction that applies to platforms, and to the algorithmic precarity of content creators (Duffy 2020). This process absorbs, appropriates, and simultaneously neutralizes any critical potential of witchcraft as an anti-capitalist practice, ultimately integrating it into the same perverse platformized logic.

Witchcraft also happens in a realm that represents the mythological notions of the exotic: an ambiguous and ill-defined space that fascinate outsiders. This constructed exoticism appears in various forms in the videos analysed. For example, geographic exoticism is evident in depictions of Thai horror and African deserts, as well as the symbolic European border often associated with Romania. Additionally, some videos highlight aspects of Polish culture that contribute to this sense of otherness and mystique. These representations suggest a perspective that aligns more closely with a US-centric view of the world than with a European one. From this analysis, it becomes evident that exoticism in witchcraft-related content does not always rely on geographical distance, but can also be expressed through temporal distance. In several clusters, exoticism appears in the form of a remote past rather than a faraway place. The Neolithic period, Ancient Egypt, and Indigenous North American civilizations are all invoked as temporally distant yet culturally significant sources of mystical practices and rituals. These representations often imbue witchcraft with an aura of mystery and ancient wisdom, emphasizing practices whose meanings remain uncertain yet are attributed powerful properties.

The centre of the patriarchal masculine imaginaries has reproduced a form of femininity that lies in the exotic, too; in gender there are a lot of exoticisms. From the perspective of the male gaze, there is often an attribution of a sixth sense or natural capabilities to women, parallelling a historically patronizing assumption of supposed incapacity (see, for instance, Butler 2002). In that sense, the 'womanness' of the witch is echoed in multiple videos, expanding upon an idea inherited from centuries of patriarchy that deals with independent women by banishing them to the margins of society where the fascinating and the exotic begin.

Very close to that gendered operation of cultural exclusion, is the exoticization of nature. Nature is the realm of the wild, and it lies at the margins of the civilized. A witch represents a link with that nature with her supernatural powers, such as the capacity to read

the signs of nature, predict future events, and talk to animals and spirits. The links with voodoo and ritualistic practices, or black magic (V13), that have been reproduced in the videos set culturally relevant lines explored earlier: the tribes connected to nature, the fundamental passion of the primitive, the natural harmony of the uncivilized.

The third area in the network of meanings emerging from the clusters is the association of witchcraft with evil crime, catastrophe, and unjust regimes. Witchcraft is connected to sickness (mental health and lack thereof), and to historical horrors that have been used to legitimize its portrayal as a real danger. This framing positions witchcraft as a warning—reinforcing its association with fear and social deviance. Whatever ideas of witchcraft may have previously emerged in other contexts are immediately tainted by this extra moral weight.

The review of these cultural meanings reactivates rather than challenges a contentious understanding of witchcraft as a product of class, race, and gender inequalities. The clustering of these meanings reinforces pre-existing societal narratives about witchcraft, embedding it further within historical and ideological biases. Rather than offering a critical reassessment, these representations continue to reproduce the same scripts that have long defined witchcraft in popular imagination.

The cultural representation that emerges from the algorithmic alchemy seems to be making an effort to build a culturally relevant meaning of the network of videos as a folkloric conduit; but such an effort says more about the cultural context in which the algorithm emerges and sits than it does about the algorithm's own underlying intention. This statement is far from exempting the algorithmic operation from responsibility; rather it emphasizes the need to embed those algorithms within the cultural context of their activity. Algorithms cannot be neutralized, or made external, as mechanical operations, to the cultural environment in which they live. Incapable of 'making sense by themselves', the algorithms are inevitably culturally situated, and they are therefore part of the reproductive conservative cultural circuit and machine. This entanglement needs to be critically challenged against within the context of the inequalities that algorithmic alchemy might explain and likely reproduce.

Conclusions

Trevor Blank states that 'there is a human behind everything that takes place online, and this is where the folklorist's fieldwork on the Internet should begin. We must ask ourselves; how do we interact with the computer as ethnographers . . . Who is the folk in cyberspace?' (2009, 11). This leads us to question the nature of the algorithm itself and to what constitutes a vernacular expression? We might ask whether new forms of culture and even folklore are

emerging from the algorithmic-driven forms of sharing, or whether algorithms simply reproduce and perpetuate more traditional, culturally embedded (perhaps otherwise outdated) notions about the world into present and future generations.

Examining YouTube's algorithmic outputs as forms of digital vernacular culture helps reveal emergent or reinforced social beliefs about folklore and society. However, algorithms do not merely reproduce meaning; as non-human agents, they also generate, invent, and construct within a human ecosystem of shared understandings. This article scratches the surface, opening avenues for further research.

The Power of the Witch is a rare and authentic cultural audiovisual artefact available on YouTube. We used the YouTube Data Tool to generate a network of 4,119 recommended videos from the fundamental seed video (V1). There is a possible mathematical discussion about the fairness of the YouTube recommendation, and about the modularity algorithm applied to the array of over 4,000 videos, but that discussion has not been the purpose of this article. While we acknowledge that this is a relevant topic for further exploration, we have taken the mathematical structuring of recommendations as a given for the purposes of this study. Instead, we have chosen to approach the automated sample data through cultural interpretive analysis, following the patterns that emerge to better understand how YouTube's algorithmic organization aligns with and reinforces culturally constructed meanings. The network was then visualized to facilitate the exploration of the cultural meanings suggested by the emerging clusters. Rather than being a neutral or arbitrary arrangement, the constructed network reflects the algorithm's active role in shaping the connections and interpretations that define contemporary digital folklore.

The analysis of the clusters shows that the recommendation network is not necessarily straightforward, linear, or clearly determined. Rather, the algorithmically constructed relations between the source video and the recommended videos fall within a cultural mesh of interpretations that clearly reproduces rather than challenges a culturally embedded notion of witchcraft.

This article has shown how those connections are algorithmically defined through the recommendation process embedded on YouTube. It has also shown how the videos echo a rich and complex socially-constructed conglomerate of beliefs around the idea of witchcraft. To reach this conclusion, we have interpreted the initially mathematically generated links, and they have revealed consistent social, historical, and cultural connections that offer clearly ideologically situated statements about witchcraft. These are loaded with moral values that transcend the historical contexts and build ideological frames of understanding.

The shape of the clusters, and our effort to understand their tight connection, have helped reveal that the meanings behind the clusters are the product of an interpretive process

that builds progressively and clearly. However, the overall picture that they form only adopts full density and clarity when it is connected to external cultural factors that round out and compose the meaning. The main discourse shifts into a broader cultural analysis that surpasses and takes the interpretive process away from the algorithmic mathematical quasi-randomness and moves it into the framework of shared collective human-made understandings. Not only does the algorithm create new meanings by combining former views, but it also feeds on materials that might appear too dispersed, or might be out of range to the human mind, but still fundamentally build the core of the recommendation meaning conglomerate. This is clearly visible in the quantity and scope of cultural antecedents that we have identified as feeding the recommendation algorithm.

Indeed, the findings of our analysis have shown that the reproduction of the idea of witchcraft expands along three strands that tie together different cultural narratives. These narratives emerge from the meanings recalled by the clusters, which evoke associations with nature and mystery from the remote past, and with exotic geographies and even otherworldly realms, ranging from fantasy to the supernatural. These traits reproduce a rather colonial idea that intersects with a patriarchal understanding of femininity. All those aspects that form part of the constellation of meanings also become tainted by the clusters containing concepts of evil: death, war, and political regimes. These aspects of evil that also could turn into forms of rebellion, threatening the current order, are immediately cancelled by another turn of understandings. This pattern is clearly shown by the third strand: the craft of witchcraft that involves building a sustainable alternative economic circuit of self-making and repair. It subtly moves from a very witchy, anti-capitalistic opportunity into a platformized logic of gig-survival, with self-produced audiovisual materials aiming at subscriptions, followers, or likes.

Still, evil witchcraft is not where this article has to end. Beyond the constellation of witchcraft understandings on YouTube, the contributions of this study are threefold: first, it identifies the entanglement between the digital algorithmic production and the cultural and symbolic fabric; second, it demonstrates the methodological breakthrough of combining in practice computational and interpretive methods as tools for folklore and social science studies; and third, it exemplifies the interdisciplinary territories that bring together folklore studies and social and communication science research.

On the first point, this article highlights the ongoing dialogue between cultural contexts and computational processes. While algorithmic recommendations are not consciously culturally situated, their output reflects a bidirectional dynamic: cultural contexts inform algorithms, and algorithmic outputs reshape cultural perception. The delicate balance between the double tension of the source for recommendations and its outputs is certainly an avenue worth exploring further from critical and cultural-centric perspectives.

Second, this research underscores the epistemological importance of integrating computational and cultural analysis: studying algorithms without addressing their cultural embeddedness is incomplete. This article demonstrates that such an interdisciplinary synthesis is not only possible and valuable but urgent. Understanding algorithmic culture requires attending to both the technical mechanics and the sociocultural interpretations that frame meaning.

Finally, this complex territory of algorithmically mediated culture demands decisive interdisciplinary approaches. Theoretical and conceptual creativity is needed, but this field opens vast opportunities for research across disciplines. By connecting folklore studies, digital humanities, and social sciences, our study contributes to a growing conversation about the cultural and ideological implications of algorithmic systems in shaping contemporary beliefs and traditions.

Appendix

Table 2. List of the videos referenced in the paper. To visit the videos either search directly using the ID or type https://www.youtube.com/watch?v= and then the ID.
[typesetters: please insert Table 2 here]

ORCID

Hantian Zhang https://orcid.org/0000-0003-2759-5609
Yulia Belinskaya https://orcid.org/0000-0002-9666-392X
Diane Rodgers https://orcid.org/0000-0002-3117-4308
Joan Ramon Rodriguez-Amat https://orcid.org/0000-0001-8391-3638

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Biographical Notes

Dr Hantian Zhang is a Senior Lecturer in Media at Sheffield Hallam University. With a PhD in Digital Media and Communication awarded by the University of Edinburgh, his research covers cultural and technical aspects of social media, including influencers, platforms, content, audiences, participatory culture, and algorithmic networks. His key research projects explore the audience engagement behaviours of YouTubers, YouTube algorithmic video networks, gamification elements on online streaming apps and YouTubers' cross-platform content distribution behaviours.

Dr Yulia Belinskaya is a Researcher at the Institute for Creative Media Technologies, University of Applied Sciences, St. Pölten, Austria. Her main areas of research cover issues concerning the governance of communicative spaces and mechanisms of public opinion manipulation. Her interests include cultural and political communication, digital media in hybrid and authoritarian regimes, the spread of mis- and disinformation across various platforms, questions concerning freedom of expression, pornography and obscenity, restrictive media policies, and ethics of communication.

Dr Diane A. Rodgers is a Senior Lecturer in Media and co-founder of the Centre for Contemporary Legend at Sheffield Hallam University, and President-elect of the International Society for Contemporary Legend Research. Her research expertise is in folklore, folk-horror and hauntology in British film and television with research interests in broader media representations of folklore and contemporary legend. Current projects include the AHRC-funded Dracula Returns to Derby and the National Folklore Survey for England.

Dr Joan Ramon Rodriguez-Amat is Senior Lecturer in Journalism, Media and Communication at the University of Sheffield, UK. His main area of research revolves around the communicative spaces; the cultural constructions of time and space, and citizenship and power. This triple discussion emerges in the intersection of media governance research, cultural production, and democratic debates; and the communities and identities—among them sexual, national, and cultural identities—growing from the geopolitics of social media platforms and communication technologies. He likes to mix computational tools with human critical interpretive approaches.