

Networks at Scale. A Metadata-Based Approach to Detecting Links Between Fanfiction-Communities

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Fanfiction is a growing practice. Ever since its beginning, either dated with transformations of ancient literature (Farley 2016), unauthorized sequels around 1800 (Thomalla 2021) or rewritings of Sherlock Holmes in the late 19th century (Cranfield 2014; Kuhns 2014), the practices of fan writings have continuously evolved.

But even more, fanfiction is collaboration. Inspired by others' original work, interested "fanatics" share their favorites (texts, fandoms or even stars) and enjoy the exchange of their fannish works. With the invention of Web 2.0 and the (supposedly) limitless openness of the internet and its communities (Dobusch / Dobusch 2022), specialized websites and communities for fans developed: from self-hosted archives (e.g. *Archive of our Own*, *Fanfiction.net*) to commercial providers such as *Fanfiktion.de*.¹ As fanfictions and fan communities have become more visible, their practices gained research interest, with the fields of digital social reading (Pianzola 2021), author-reader interaction (Hill / Pecoskie 2014), and genre-specific transformations of the original's canon (Brottrager et al. 2022) being only three examples.

Our ansatz focuses on fanfiction communities as networks of interaction (Carvallo / Parra 2019), whereby we modeled a network of more than 28,000 users and their 56,000 reviews posted or updated on the German-speaking forum *Fanfiktion.de* in 2020. We explored this network using the modularity clustering algorithm (Brandes et al. 2008), which enables the determination of communities in large networks (Papadopoulos et al. 2012) by measuring the strength of clusters within the network. Figure 1 shows the user-review network with its modularity clusters.

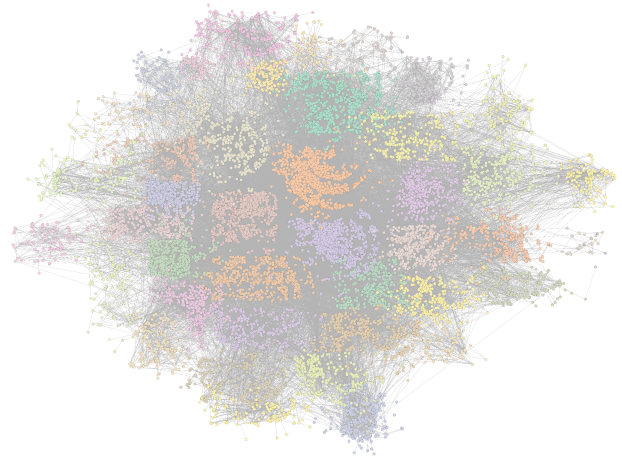


Figure 1. User-review network of Fanfiktion.de users. Nodes represent users; links denote reviews. The colors stand for modularity clusters.

Approaching the network as an assembly of clusters is inspired by the notion of homophily that has dominated social network analysis in the past decades (McPherson et al. 2001; Schaefer et al. 2011; Lee et al. 2019; Glawion 2023). Homophily in social networks can be understood as 'similarities attract' – interacting individuals are more likely to have some other traits in common. Hence, our expectation was that users of a cluster might be similar in some ways – perhaps in their choice of fandoms, themes, genres or age restrictions.

Previous analyses of fanfiction networks have shown that despite the ideal of collaborative fanfiction reader-writers, more traditional roles of author- and readership are also present: When examining centrality measures such as out- and indegree, a handful of star authors and hyperactive reviewers can be identified (Weitin et al. [forthcoming]), who both conform to established dynamics of literary production and consumption. In contrast to this, our analysis aims to identify a level of interaction between users that represents the ideal of collaboration: Using the geometric mean of in- and outgoing links (Rani et al. 2019), i.e. the number of received and written reviews, we scale the network's mid-level structure of reader-writers. By combining in- and outdegree, the geometric mean allows to identify users who write and review fanfictions; setting aside users who only receive reviews—a characteristic of the forum's stars—or only write reviews. Figure 2 represents a variation of Figure 1, now only showing users with a non-zero value for the geometric mean.

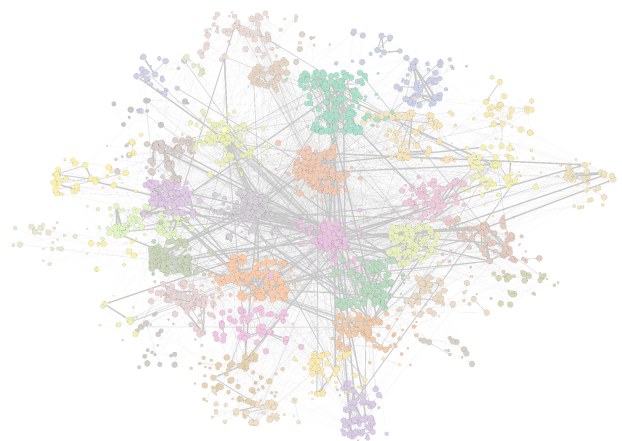


Figure 2. Variation of Figure 1, including only users with non-zero values for the geometric mean of in- and outdegree.

Next, we explored each cluster’s metadata, including both node- and link-level information. As each link represents reviews to particular texts, we aggregated the metadata, extracting fandoms, age restrictions and genres of all texts of intra-cluster links. Additionally, we employed two strategies of generalization for all links: As *Fanfiktions.de* allows combining several genre tags, we extracted the ten most frequent individual tags and classified the links based on these genres. We also identified the dominant age restriction of all texts represented by each link.

While the clustering was done automatically, each group can be characterized by its fandoms, parental guideline rating (PG) and genres: Examining Cluster 14, for example, the purple cluster at the bottom of the network in Figure 2, we find a structure dominated by fantastic literature, mostly featuring magical creatures (“How to train a dragon”, “Eragon”, “Warrior Cats”), but also with a Sci-Fi background (“Star Wars”, see Figure 3).

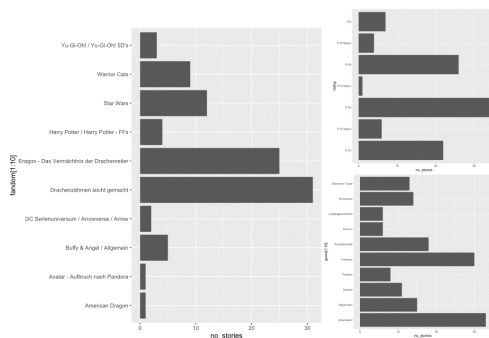


Figure 3. Metadata of Cluster 14: Fandoms (left), age recommendation (top right) and genres (bottom right).

Additionally, these characteristics can be used to highlight links between different clusters. Figure 3 also shows that Cluster 14 contains mostly fanfictions with plots of adventure or fantasy. By identifying, for example, all links featuring fantasy as a genre tag, clusters primarily based on fantasy references are revealed. The result is shown in Figure 4, where the blue fantasy-links accentuate dense connections between the Clusters 14, 16 and 0, with Cluster 0 mainly focusing on medieval fantasy literature (“Lord of the Rings”, “The Hobbit”, “Song of Ice and Fire”, “Merlin”). Cluster 16 is more diversified but prevailed by the long-time TV-series “Supernatural” and the audio drama “The Three Investigators”.

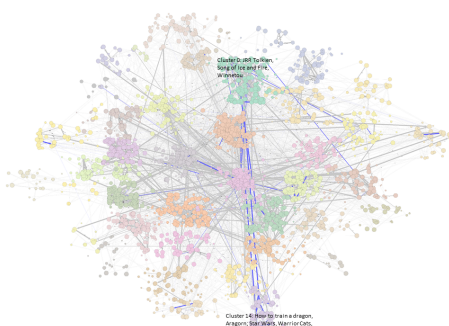


Figure 4. Variation of Figure 2, highlighting fantasy-links between different clusters.

A second experiment addresses a unique fanfiction genre: slash². Mapping all slash-stories within the network in Figure 5³ reveals a network-wide structure and multiple connections across clusters with differences in density and connectivity. Various connections can be found between the sports-Cluster 15 and Cluster 16 (Harry Potter), while Cluster 19 (K-POP) shows dense connections exclusively between intra-cluster nodes. Clusters focusing on youth fandoms (e.g., 20, kids TV series) have hardly any slash-links, probably due to younger users interacting with these fandoms.

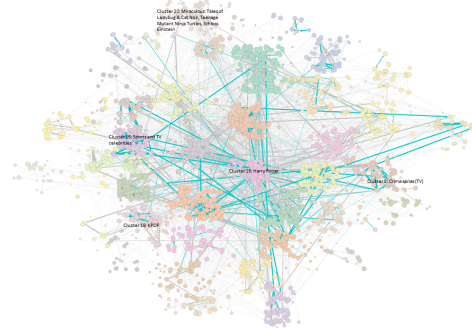


Figure 5. Variation of Figure 2, highlighting slash-based links.

As we have shown, the combination of a filtering mechanism and metadata-based analyses provides a productive approach to large networks, not only for community-detection but also for identifying shared attributes. These shared attributes across dense communities show that collaboration on fanfiction forums often transgresses fandoms and is based on more complex combinations of genre variations, providing additional insight into fannish reading and writing practices.

Notes

1. <https://archiveofourown.org>, <https://www.fanfiction.net>, <https://www.fanfiktion.de>.
2. The genre stands for stories about homoerotic romantic and/or sexual relationships. The name derives from the “Star Trek” fandom, where homoerotic fanfictions about Kirk and Spock have first been shortened to “K/S” and finally to slash (Coppa 2006: 48pp).
3. In our corpus, the slash-identifier is linked to the age recommendation, see Figure 3.

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