




# Dribbble: Exploring the Concept of Viral Events on an Art World Social Network Site

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**Abstract.** While virality is a much-studied topic on popular social media sites, it has been rarely explored on sites like Dribbble, a social networking site for artists and designers. Using a mixed-method approach, we explore virality from a user-centric perspective. Interviews with informants confirm that viral-like events do exist on Dribbble, though what spreads are stylistic choices. While what spreads is different than on other platforms, our work suggests that the mechanics that drive these events are similar, suggesting an underlying social phenomenon that is reflected in different ways on different platforms. Our results are supported by regression modeling using variables identified by our informants. Our work contributes to social media studies since smaller sites like Dribbble are rarely studied, particularly using mixed methods approaches, as well as to the body of research around information diffusion and viral events.

**Keywords:** Dribbble · Social media · Virality · Art worlds · Mixed-methods

## 1 Introduction

This paper explores the concept of virality on [Dribbble.com](https://dribbble.com), a social network site created in 2009 for designers and artists to share and get feedback on their work. Virality is generally characterized as an emergent process where by many individuals simultaneously diffuse information, or content, into their own social networks [9]. The results can be that trending topics emerge or that otherwise localized information can spread to distant parts of the larger network. Virality is a much studied topic on sites like Twitter and Facebook, both of which provide functionality that directly supports resharing content. Dribbble, however, does not provide features for resharing the art of others, and yet design and art do evolve over time as designers and artists influence other artists [1]. In an effort to understand these processes, Becker [1] has called for diffusion studies in specific art worlds, networks of actors whose cooperative work produces art. Becker also notes that to truly understand social phenomena, such as virality, requires that we study more than the few central actors in a network, for example, sites like Twitter and Facebook. Thus, by studying a niche site like Dribbble, this work contributes to our understanding of virality on social media in general by allowing us to compare the similarities and differences of virality on a small and larger sites whose affordances differ.

In this work, we use a mixed method approach to understand if something like virality takes place on Dribbble and if so, what are the nature and driving factors of

these events. We use interview data from 14 participants to understand how Dribbble users use the site, and how they think about virality on the site and the factors that might influence it. We find that while works of art are not reshared, our interview informants do tend to map the concept of virality onto art that becomes very popular, particularly when this happens suddenly. This is similar to how other studies have measured virality on sites like YouTube by using the number of views a video receives [2, 10]. Our informants also suggest a number of factors that drive these viral-like events, such as the number of followers one has. Using regression modeling on data collected from Dribbble’s public Application Programming Interface (API), we confirm that some of the factors identified by our informants are related to the number of views an artwork receives, which allows us to discuss how these factors are similar and different to factors that drive viral events on sites like Twitter. Data from our informants also suggest that what spreads on Dribbble aren’t specific works of art or design, but rather, that users ‘borrow’ elements from other’s works, such as color palettes, design solutions and other stylistic choices, which they employ in their own works. These design flows can turn into ‘trends’ on the site and trends on the site can also be driven by larger design industry trends.

Our work makes a contribution to the study of viral events identifying common patterns on large and small sites that provides some insight into how emergent human behavior is played out through different affordances on different kinds of social media sites. We plan to conduct and analyze more interviews to verify we have reached saturation, and to build regression models that test additional variables. For example, initial results from work not reported here suggests that we can use Google Cloud Vision, an image content analysis service, to computationally label individual design and art posts that may shed light on the relationship between the number of views art receives and the types of content and elements of style, such as line work or color palettes. Our hope is that this work informs work on other niche social media platforms, such as on academic social network sites and music sites, which we believe will broaden our understanding of the social behaviors that underlie viral events.

## 2 Literature

We adopt Becker’s [1] concept of an art world to understand and explore Dribbble. Art worlds are made up of a network of actors whose cooperative and collective activities result in the creation of works of art. In other words, an art world is where the mundane work of creating art is done. Conventions arise out of the interactions and activities of the actors that inform artistic production, mediate cooperation and define what qualifies as *good art* within the art world. Becker notes that art worlds have no boundaries, rather they are overlapping networks where artists are embedded with other actors who support the work of creating art. For example, the technical support agent at Adobe who answers an artist’s question about Adobe Illustrator is part of the art world, as are those who view, give feedback and appreciate the art.

Dribbble, whose terminology is based on basketball terms, functions as the online part of an art world by enabling *players* (users), to form networks through follower and following relationships. Players can collectively signal what constitutes good art by

liking and commenting on other player's shots (art or design work). Players also signal enthusiasm for other's shots by posting rebounds (i.e. response art – art that they make in response to other people's art that will generally be a variation of an original art). When a shot receives more than one rebound, it is referred to as a *playoff*, and is featured on the Playoffs page. Dribbble also has dedicated pages for shots that 'popular', 'recent', and 'debuts' which are for the first shot posted by those become a player after receiving an invite. The concept of 'good art', as defined by those in the art world, is an important one since it might be related to or overlap with viral-like phenomena. Also, Nahon and Hemsley [9] have theorized that social norms are reinstated and transformed through the process of diffusion. Thus, one explanation for the evolution of art on a site like Dribbble is that as artistic innovations diffuse through art worlds, they may change the conventions (roughly equivalent to social norms) that inform artistic production, mediate cooperation and define what qualifies as good art [1]. By focusing on Dribbble, we are examining a subset of an art world, one where viral-like events might happen. Note that while Dribbble is primarily thought of as a site for designers, we will generally use the term "art" since we are borrowing from Becker's conception of an art world.

There are not many studies that look at art related social media sites, much less with a specific focus on viral events. A different study looking at Dribbble used a database of U.S. baby names [18] and found that male designers tended to have more success at getting views and likes and that while women had fewer ties in the site's social network, they had more cohesive social networks than men [15]. Similarly, a quantitative study of Behance, another online social network site for designers, found that males tended to have more followers and that grayscale images tended to receive less attention [6]. Salah et al. [12] looked at the relationship between network clusters and artistic subcategories on DeviantArt, a site for a broad range of artists, and found that clusters of users on the site tended to form around production techniques, not types of art. None of the above sites focuses on viral, or viral-like events on an art site. However, Salah and Salah [11] explored the diffusion of art innovations on DeviantArt. They started by selecting artwork that was posted as a 'resource', or a downloadable stock image, which are intended to be mashed up or embedded in other artists work. When other artists use these stock images in their own work, Salah and Salah consider this a kind of diffusion of technique. We note that this work starts with content intended by the artists to be used by other artists, and so what Salah and Salah are looking at is not the emergent crowd driven event we typically associate with a viral event. Also, all of the work above only uses quantitative analysis, and so misses the experience and views of the site's users. We address this by taking a mixed methods approach, and specifically, we use interviews to get the player's perspective to answer our first research question: *RQ1: Does something like virality exist on the niche social media site Dribbble?*

Dribbble does not have a share or retweet button, so players cannot share the work of others directly into their own networks. Conceptually, Dribbble is more like YouTube in that messages themselves do not spread. On YouTube, the concept of virality is that users share links to a video, which is embedded on the poster's channel page [2]. So what is being shared is actually a Universal Record Locator (URL), and studies [10] typically use the number of views a video gets as a measure of virality. As mentioned

above, there is some evidence that users on DeviantArt do adopt the style and technique of other users into their own work [11]. It is then reasonable to assume that the diffusion of aesthetic techniques might exist on Dribbble too. Thus, our next research question is: *RQ2: If viral-like events do happen on Dribbble, what is it that is diffusing in the Dribbble art world?*

Nahon and Hemsley [9] theorize that virality is a negotiated process between the crowd and more influential actors who exert disproportionate influence over the viral process. They refer to these influential actors as network gatekeepers, and their power is a byproduct of their position in networks. That is, they generally have between a few and many orders of magnitude more followers than the typical user, which gives them access to more information resources and gives them the “ability to link networks together, allowing information to travel far and fast and to connect people to information and ideas” [9:48]. Of course, virality does not happen without the crowd to propagate content, ideas or behaviors - we will use the cover term messages to mean all of the kinds of things that could go viral. In their view, network gatekeepers are needed to promote content and link together networks, but the crowd must also view, like, and share the message into their own networks for the message to be considered viral. Thus, gatekeepers may promote messages that do not go viral if the crowd opts not to adopt or share them into their own networks. Likewise, members of the crowd may find their messages stay stubbornly obscure because they lack the connections for the messages to spread much farther than their own followers.

Of course factors like timeliness, context, attributes of the sender, and the content of the message are also important factors in what spreads [9]. For example, on Twitter the number of followers and friends [14, 17], the account age and other profile information [8], and network relationships [7, 16], can all affect the diffusion of a message. Other large scale work has shown that the user’s account age, number of tweets they have posted, and the number of their tweets that have been favorited are also related to how often they are retweeted [14]. Tweets with hashtags, URLs and @mentions all tend to be retweeted more than those without those textual features [13]. Given all this we should expect that if viral-like events happen on Dribbble we ought to find that similar factors are at work. Thus, our final research question is: *RQ3: What are the measures and factors of viral-like events on Dribbble?*

### 3 Methods

In this study, we adopt a sequential exploratory mixed-method approach [3]. We start with qualitative data collection and analysis to explore a phenomenon through semi-structured interviews with Dribbble’s members. We use data from our informants to answer our first and second research question and to inform the variable selection for a regression model, which we use to answer the third research question. Data for the regression model was drawn from Dribbble’s API, as described in the sections below. Where appropriate we include control variables suggested in literature for other sites, such as the number of hashtags [13, 14].

Recruitment of interviewees was conducted by email. Dribbble does not have an internal messaging system, though some players post their email addresses on their

profile page. Using Dribbble’s API we have collected over 400,000 user profiles and metadata for more than 700,000 shots. To select participants, we note that less than 5% of users include email addresses, and of those, we focus on players who list english as their language. From the remaining, we randomly selected batches of users to email to ask to participate. We offered a \$20 Amazon Gift Card for an hour interview about their experience with the platform. Audio-only interviews took place on Adobe Connect, a web conferencing tool, and were recorded for later transcription.

We develop a linear regression model using number of views of a shot as the dependent variable. Our independent variables include metadata about the shot or the player who posted it. These include the number of followers of the player, the number of hashtags listed in the shot’s description text, the age of the shot, the number of buckets a shot is in, where a bucket is a grouping mechanism for players to group their own or other shots into collections. The shots are drawn from 100 randomly selected players, stratified by their number of shots. The numbers of shots per user ranges from 29 to 688 with an average of 82.47. In total, we have 8,318 shots.

To satisfy the assumptions of linear regression (dependent and independent variables are linearly related, and errors are normally distributed with constant variance), we transformed our dependent variable with logarithm function. We also removed 6 outliers, each of which will be discussed separately. The variance inflation factor scores of the independent variables range from 1.0 to 1.2, indicating that our model does not suffer from multicollinearity. As is typical [4], we use plots for regression diagnostics, all of which are available upon request.

## 4 Results

In total, we conducted 14 interviews (11 males and 3 female) with ages between 18 and 34 (mean = 26.8). Most of our participants have been using the platform for more than 3 years. Our respondents describe themselves as UI/UX or product designers, graphic designers or illustrators, or motion graphic designers. Players posted shots to gain exposure for their work, get feedback, receive validation and to challenge themselves (participate in challenges or rebounds). All of them indicated that they used the platform for artistic and creative inspiration, while subsets indicated that they use the platform to get feedback on their work, promote themselves, maintain a public presence and portfolio, find jobs or other designers to work with, or to keep up with design industry trends. When asked about other platforms they posted art (designs) on, our participants listed, in order of frequency, Behance, Instagram, Facebook, Twitter, DeviantArt, Pinterest and Vimeo.

Dribbble allows users to view, like, comment on, rebound and save into buckets the shot of others. Several informants indicated that they would like, comment on or save into buckets shots that they thought were “good”. When probed about what constituted good design (roughly, Becker’s concept of good art), our respondents indicated work that solved design problems in a novel way, evoked emotion, conveyed meaning, or were visually appealing constituted good art. Some respondents said that they may also like or comment on other’s work as a sign of support and that comments were also used to ask questions or provide feedback. In our conversations with them, we learned that

many saw a hierarchy in the meaning of these features where rebounds to one's shots might be thought of as the highest compliment, followed by comments and finally likes. For example, informant 8 noted of rebounds that, "I think it's a way of complimenting the original artist." Thus, we find that Dribbble provides a number of indicators of good art, which is key element of an art world.

In discussing virality with our informants they frequently mentioned the idea of design trends on Dribbble, where many people posted shots with a similar look and everyone is responding to, or influenced by, others. One informant referred to this as a design "echo chamber". Our informants indicated that trends could originate outside of Dribbble. For example when Apple released its Touch Bar, designers across Dribbble quickly posted their own versions of Touch Bar icons. Informant 2 told us that their lead designer "designed a Touch Bar for Dribble right away and then we posted it on Dribble and then we got lot of likes because at that time everybody was interested in that and everybody was looking for it, so we got lot of likes and exposure." But design trends can also be local to Dribbble, such as when Dribbble noted on their blog that a wave of purple shots had washed over their Popular Shots page [19]. Thus, part of the answer to the first research question is that yes, something like virality exists on Dribbble, and one way it manifests is in the form of design trends.

One of the most important uses of Dribbble by our informants was to seek out inspiration and keep up with the trends e.g. "It usually happens early in the morning when I come to the office and see quickly okay what's happening in the design community, what's new" - Informant 6. While players indicate they do not copy the shots of others, the majority of our informants indicated that their own work was influenced by other players e.g. "I always end up with my own personally unique idea that got inspired by some users" - Informant 4. They describe adopting into their own work design elements like color palettes, line styles, textures, fonts and so on. Places they find such stylistic inspiration on Dribbble include their own landing page, which aggregates recent shots from those they follow, the Popular Shots page, which appears to order shots by a proprietary algorithm, or by using the site's search tools. The search tools allow players to find shots by keywords or colors. Thus, players may have a design problem in mind, or a set of requirements from a client, and after browsing Dribbble, they would borrow, for example, a color pallet or a line style that inspired them and incorporate it into their own work. Thus, in answer to research question 2, what seems to spread on Dribbble are stylistic elements of users.

All participants explained the concept of virality as shots that become very popular as measured by number of views. Informant 5 said, "The thing that is the top or get the most likes and views ... I'd call it a viral". Several of our informants also noted that having their shot featured on the Popular Shots page was also a sign of virality since that seemed to result in shots getting even more views. Thus, part of the answer for research question 3 is that views can be used to measure a viral-like event.

Some seemed to think that shots going viral was driven by luck, but most felt that those with more followers would get more views just because their shows would show up in more people's feeds. Specifically, one of our informants explained, "in order for your work to get viral, you need to have a lot of followers and you need to have a lot of exposure" (Informant 14). A few informants mentioned that Dribbble's algorithms seemed to prioritize some shots over others in the order of appearance on the Popular

Shots page. A couple of informants also clued us in about how to game the system by posting links to their shots on other sites to bump up the number of views their shots got. The idea being that this behavior might result in their shot getting featured on the Popular Shots page. Informants also linked the idea of virality to exposure, indicating that having your shot go viral could bring you a lot of attention in terms of likes, comments and new followers. So in terms of factors that could be drivers of viral-like events on Dribbble (research question 3), the number of followers seems to be the main factor that informants could identify.

Our regression model to confirms that followers are related to views, but as noted above, we included other variables as well. The results are presented in Table 1. Since we transformed the dependent variable, we report inverse log of the estimated coefficients, standard error, and confidence interval for easy interpretation. The R-Squared of 0.63 indicates that our predictors explain the variation in the outcome sufficiently well. All predictors are statistically significant. The estimated coefficient of the number of followers of 1.002 suggests that one more follower increases the number of views by 0.2%, while holding other variables constant. The hashtags’ estimated coefficients of 1.07 suggests that adding one more hashtag increases the number of views by 7%, and the estimated coefficient of 1.06 for buckets suggests that being in one more bucket increases the number of views by 6%. Surprisingly, the estimated coefficient of shot age is 0.99, suggesting shots a day older decreases the number of views by 0.01%, suggesting the number of views shots receive has a short life span. It may also signal the upward spike characteristic of virality on other platforms [5].

**Table 1.** Regression results.

Variable	10^Est_Coef	10^Std. Error	LWR - UPR	t-val (p-val)
Intercept	204.55	1.02	196.2124 - 213.2510	250.47 (0.00)
Followers	1.002	1.00	1.0002 - 1.0002	58.09 (0.00)
Hashtags	1.07	1.00	1.0657 - 1.0737	39.33 (0.00)
Buckets	1.06	1.00	1.0589 - 1.0637	50.92 (0.00)
Shot age	0.99	1.00	0.9997 - 0.9998	-15.57 (0.00)

Signif. codes: 0 ‘\*\*\*\*’ 0.001 ‘\*\*\*’ 0.01 ‘\*\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

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Residual standard error: 0.6943 on 8307 degrees of freedom

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Multiple R-squared: 0.6259, adjusted R-squared: 0.6258

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F-statistic: 3475 on 4 and 8307 DF, p-value < 0.00

A closer look the 6 outliers removed from the model shows that they are among the top 6% of shots with most views and were created by 2 users, namely, A and B. These 2 users have relatively high number of followers (A: 5,825 and B: 6,198), but a relatively small number of shots (A: 68 and B: 129). The average number of followers and shots of the other top users is 2,648.35 and 151.25, respectively. We wonder if a high ratio of shots to followers signals exceptional artists and will pursue this in future work.



## 5 Discussion

For Becker [1], an art world is a place where the mundane work of making art gets done. Our informants suggest that one of the most important uses of Dribbble is as a source of inspiration. That is, when players have design problems, need to get ideas for a project, or are just looking for a challenge, they browse through the shots of other players. And, while players are quick to say they do not steal the work of others, they describe adopting elements of style, like color palettes or line work, from the shots of others and using them in their own work as an important use of Dribbble. Some even create buckets of themed shots for inspiration and others describe mixing elements of a set of shots together into a new shot. Thus, part of what happens on Dribbble is that users construct their artworks by leaning on the work of others. This is akin to how Becker describes artwork emerging out of the collective activities of the actors in an art world. That is, shots become useful resources for others.

We also see this as what is diffusing on Dribbble: elements of design. Like on other platforms, most things do not diffuse far from the source [9], and we suspect that few shots actually go viral (reaching many actors) even when they do influence the artwork of a few players. And yet, our informants do note that design trends do sweep through Dribbble: many players simultaneously posting shots with strikingly similar design elements in a phenomenon that seems reminiscent to the way Nahon and Hemsley describe viral trends on sites like Twitter [9].

Likewise, some of the mechanics that drive viral-like events on Dribbble are similar to factors that drive viral events on other sites. For example, we have shown that the number of views a shot gets is significantly related to the number of followers of the player who posted it. This is similar to studies showing a relationship between the number of followers someone has and the number of retweets they get [13, 14]. Respondents also tell us that shots that reach the popular page get more views and that Dribbble's algorithms probably play a role in the number of views a shot gets. We can view both the popular page and the site's algorithms as performing the role of *network gatekeepers* in Nahon and Hemsley's view of viral events [9]. That is, some actors (technological ones in Dribbble's case) can select and promote messages such that they reach a much larger audience than they would otherwise. Without these network gatekeepers, users may find their messages staying stubbornly obscure because they lack the connections for the messages to spread much farther than their own followers.

Nahon and Hemsley claim that "viral events are not new" [9:1]. They note that on December 1<sup>st</sup>, 1955, Rosa Parks was arrested in Montgomery, Alabama, for not giving up her seat to a white person on a segregated bus, and that the news spread via phones, hand-bills and word of mouth, such that within 3 days, over 40,000 blacks had joined a boycott of the bus system. They say that what is new is that with social media "a viral video, a news story, or a photo can reach 40,000 people in hours, or even minutes, instead of days" [9:1]. We suggest that what we see as viral-like events on Dribbble reflects a basic human phenomenon that has always existed and is manifest in different ways depending on the context and the mechanisms available to people. Before the internet, phones, hand-bills and word of mouth spread news through crowds; on Twitter 140 characters can be retweeted by thousands; on Dribbble many people



viewing the same artwork(s) may adopt elements of it into their own work, such that echo-chambers, or design trends emerge. In future work we intend to do more detailed comparisons to tease out the similarities and differences across platforms in an effort to isolate what is platform specific and what are the fundamental human behaviors that drive viral events.

## 6 Conclusion

This initial work examines the concept of virality in the Dribbble art world using a mixed-method approach. We began with the semi-structured interviews with the platform's users in order to understand the larger context of Dribbble's Art world, giving us a user's perspective of the site and of how viral-like events work there. With the interviews, we identified a construct for measuring virality as well as some influential predictors. We then used a linear regression model to confirm the relationships amongst variables. We discuss the form that virality appears to take on Dribbble, and note the possibility of using computational methods to identify and track the diffusion of design elements. This work serves as a bridge connecting an extensive body of literature concerning virality in social networks to a significantly smaller body of work looking at niche art sites, like Dribbble. Our work confirms that the mechanics that drive viral-like events on Dribbble are similar to factors found elsewhere such as number of followers and the practices of network gatekeeping.

It is important to note that we have conducted only 14 interviews although the coding of interviews suggested that we already reached data saturation. In future work we intend to use a computational method to detect the diffusion of design elements and improve our regression model by controlling for other factors such as artist's gender, age of account and other factors suggested by the larger body of viral events.

## References

1. Becker, H.S.: *Art Worlds*. University of California Press, Berkeley; London (2008)
2. Burgess, J., Green, J.: *YouTube: Online Video and Participatory Culture*. Polity, Cambridge (2009)
3. Creswell, J.W.: *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage Publications, Thousand Oaks (2013)
4. Faraway, J.J.: *Linear Models with R*. Chapman and Hall/CRC, London (2004)
5. Hemsley, J.: Studying the viral growth of a connective action network using information event signatures. *First Monday* **21**(8) (2016). <http://dx.doi.org/10.5210/fm.v21i8>
6. Kim, N.W.: *Creative Community Demystified: A Statistical Overview of Behance*. arXiv preprint [arXiv:1703.00800](https://arxiv.org/abs/1703.00800) (2017)
7. Kwak, H., Lee, C., Park, H., Moon, S.: What is Twitter, a social network or a news media? p. 591 (2010). <https://doi.org/10.1145/1772690.1772751>
8. Lee, J., Ahn, J.-W., Oh, J.S., Ryu, H.: Mysterious influential users in political communication on Twitter: users' occupation information and its impact on retweetability. In: *iConference 2015 Proceedings* (2015). <https://www.ideals.illinois.edu/handle/2142/73456>. Accessed 29 Sept 2015

9. Nahon, K., Hemsley, J.: *Going Viral*. Polity Press Cambridge, Cambridge (2013)
10. Nahon, K., Hemsley, J., Walker, S., Hussain, M.: Fifteen minutes of fame: the power of blogs in the lifecycle of viral political information. *Policy Internet* **3**(1), 6–33 (2011). <https://doi.org/10.2202/1944-2866.1108>
11. Salah, A.A., Salah, A.A.: Flow of innovation in deviantArt: following artists on an online social network site. *Mind Soc.* **12**(1), 137–149 (2013). <https://doi.org/10.1007/s11299-013-0113-9>
12. Salah, A.A., Salah, A.A., Buter, B., Dijkshoorn, N., Modolo, D., Nguyen, Q., van Noort, S., van de Poel, B.: DeviantArt in spotlight: a network of artists. *Leonardo* **45**(5), 486–487 (2012). [https://doi.org/10.1162/LEON\\_a\\_00454](https://doi.org/10.1162/LEON_a_00454)
13. Suh, B., Hong, L., Pirolli, P., Chi, E.H.: Want to be retweeted? Large scale analytics on factors impacting retweet in Twitter network. In: 2010 IEEE Second International Conference on Social Computing (SocialCom), pp. 177–184 (2010)
14. Uysal, I., Croft, W.B.: User oriented tweet ranking: a filtering approach to microblogs. In: *Proceedings of the 20th ACM International Conference on Information and Knowledge Management*, pp. 2261–2264 (2011)
15. Wachs, J., Hannák, A., Vörös, A., Daróczy, B.: Why do men get more attention? Exploring factors behind success in an online design community. arXiv preprint [arXiv:1705.02972](https://arxiv.org/abs/1705.02972) (2017)
16. Yang, Z., Guo, J., Cai, K., Tang, J., Li, J., Zhang, L., Su, Z.: Understanding retweeting behaviors in social networks, p. 1633 (2010). <https://doi.org/10.1145/1871437.1871691>
17. Zaman, T.R., Herbrich, R., Van Gael, J., Stern, D.: Predicting information spreading in Twitter, pp. 17599–17601 (2010)
18. Baby Names from Social Security Card Applications-National Level Data (2016). [data.gov. https://catalog.data.gov/dataset/baby-names-from-social-security-card-applications-national-level-dat](https://catalog.data.gov/dataset/baby-names-from-social-security-card-applications-national-level-dat)
19. Dribbble - Show and Tell for Designers. <https://dribbble.com/stories/2017/08/24/shot-block-purple-reign>. Accessed 11 Sept 2017