When Content Decides Where You Belong: Investigating Micro Communities on VSCO

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Abstract

As content-sharing platforms grow in size, it becomes important to understand the different micro communities of users in order to scale emerging needs and behavior of the community. Platforms such as Facebook, Twitter, Instagram, etc. are designed to be socially translucent with features reflecting real-world social interaction and networks, which essentially become a basis for how micro communities are formed on these platforms. In this work, we investigate micro communities on VSCO, a content-sharing platform geared towards artists and photographers, that is devoid of typical social media interactions while being opaque about the underlying social network. Without these features we hypothesize that the user-generated content is responsible for how micro communities are formed on the platform.

Introduction

In this internet age, content-sharing platforms such as Facebook, Twitter, YouTube, Instagram, Reddit, etc. have become a common part of our daily lives. These platforms are designed not only for hosting user-generated content, but also for harboring online communities. As online communities grow in size, different sub-groups of users sharing common interests (e.g., sports, photography, hiking, etc.) or traits (e.g., high-school, college, geographical location, etc.) emerge (Boyd and Ellison 2007). Identifying and understanding the different active subgroups of users, or micro communities, can help in providing deeper insights about the overall community - in terms of how the members operate and engage with others, and emerging behavioral patterns and needs of the community (Chin and Chignell 2007).

In addition to posting user-generated content, most of these platforms offer features which mimic social interactions one might encounter in real-world. For example, users can be "friends" with other users, and communicate with them on Facebook or Snapchat. Facebook allows users to create or join groups and follow pages based on shared interests. As a result, these online social interactions form the basis of different micro communities that users on these platforms become part of (De Salve, Guidi, and Michienzi 2018). Since these social interactions form the crux of these platforms, these platforms are also designed to be socially translucent (i.e., "digital systems that support coherent behavior by making participants and their activities visible to one another" (Erickson and Kellogg 2000)), essentially being transparent about the friend/follower network of users, in terms of how many friends or followers a user has and who they are. These popularity indicators, in combination with other social currency (i.e., likes, shares and view counts for posts, etc.), further drive the platform recommendations for who to follow, thus reinforcing the role of social interaction features in the formation of micro communities on these platforms.

VSCO (Visual Supply Company)¹ is a content-sharing platform geared towards artists and photographers, supporting their creative processes with photo and video editing tools, and educational resources, while allowing them to share their work with the community (VSCO 2021). This platform, available on iOS, Android and web, currently has over 30 million users. On the home page of the application, a user typically sees a strictly chronological feed of content posted or reposted by users they follow, along with content that has been curated by specialized curators at VSCO. The platform, however, is intentionally designed to keep the users' focus on just the content being shared, and restricts social interactions or currency one would typically find on other content-sharing platforms. For example, users cannot message others, nor post comments on photos. While users can *favorite* or *repost* other photos, they cannot see how many times that photo has been favorited or shared. Similarly, users can follow other users, but cannot see who others are following or being followed by.

This opaque nature of social networking features on VSCO, combined with a deliberate design decision to hide standard forms of social currency and social interaction, essentially leads to a larger emphasis on the content being a factor for users deciding who to follow. In this paper, we attempt to understand the role played by the content shared by users in the formation of micro communities on VSCO without the traditional forms of social interaction on the platform. We further investigate how and why users become part of these micro communities.

Bandura (2008) proposed the concept of *Observational Learning*, which suggests that people learn skills and behav-

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¹https://vsco.co/

iors by observing others. This concept has also been studied in the context of crowdsourcing online communities, where a study with Mechanical Turk crowd workers showed that comparing one's own solutions with solutions of peers can lead to significant gains in accuracy (Mamykina et al. 2016). In this work, we investigate whether *Observational Learning* plays a role on VSCO i.e., whether users post content similar to others in their micro communities. Specifically, we answer the following questions:

- 1. What kind of micro communities exist on VSCO?
- 2. How do users find their ways into these micro communities?
- 3. Why do users become part of these micro communities?
- 4. How do user interests and micro communities evolve over a period of time?

Methods

In order to understand the role of content in the formation of micro communities, we establish correlations between user networks and the corresponding content shared within each network.

Sampling Users

To understand the evolution of user interests and micro communities over time, we sampled 30,000 users who had posted over 10 images in the last five years. For each user, we also sampled the users they followed on VSCO.

Based on the follow network, we considered two subgraph models: 1) cliques, and 2) spoke-hub. For cliques, we sampled groups of users who all followed each each other, as we are interested in establishing whether clique members shared similar content over time, essentially forming a "content-based micro community". Similarly, we also sampled spoke-hub user network, where a user is a hub and all the users they follow are spokes. This will allow us to understand if there is a similarity in the content posted by the spokes and the hubs over time.

We first sampled all the cliques for each of the four categories. We found a total of 3335 unique users forming 4183 cliques across all four categories, with the clique sizes ranging from 3 to 7 members per clique. We also sampled 2000 hub users and 249,869 spoke users (i.e., all the users they followed) across all four categories, resulting in a total of 255,204 sampled users across cliques and spoke-hubs.

Sampling Content

For every sampled user, we sampled images posted by them in the last five years, up to 10 photos per year, broken into five summer and five winter photos. In total, we sampled approximately 4.9 million images, as some users had fewer photos and some photos were deleted by the user. To understand the nature of micro communities, we were interested in analyzing whether users followed other users because they posted photos of the same genres as themselves, or if the photos belonged to a particular genre, or had a particular set of hashtags, or used a particular set of editing tools provided by VSCO. In order to conduct this analysis, we also sampled the metadata (i.e., hashtags and editing filters used) for every photo.

To find the genre of an image, we used a ResNet CNN pre-trained on the places365 dataset for scene classification (Zhou et al. 2017) for generating scene tags and extracting image embeddings (512-d). However, we observed that the scene tags were noisy and therefore, we decided to create semantic clusters based on the image embeddings. We sub-sampled 100,000 images and clustered them into 400 different clusters using hierarchical clustering. We settled on 400 as the total number of clusters based on the elbow method. We then classified the remaining images as a member of a single cluster using a nearest neighbors approach.

Preliminary Results

Our preliminary analysis of the clusters showed a wide diversity of genres (see Figure 1) posted by the users, ranging from outdoor photos such as beaches, skiing, picnics, horizons, hiking, palm trees, etc. to quotes, food, flowers, etc. We observed that the most common cluster types were *girls taking selfies*, which affirms the "VSCO Girl" youth subculture phenomenon that emerged among teenagers around mid- to late-2019 (Jennings 2019). We found the individual cluster themes to be largely consistent for images within a cluster. However, we also observed multiple clusters with similar high-level themes, although differing in a nuanced manner. For example, we observed multiple clusters related to selfies: group selfies, close-up selfies, outdoor selfies, celebratory selfies, black-and-white selfies, etc.



Figure 1: Cluster Examples

Future Work and Conclusion

We plan to continue this analysis by first manually annotating all 400 hundred clusters, and then create a tool to visualize the different cliques and spoke-hubs. As part of the visualization tool, we also also want to visualize the content clusters for each user in a given sub-graph. Further, we want to add a time axis to observe the evolution of the sub-graphs and the content clusters. Using this tool, we will attempt to answer the research questions specified earlier.

This work has potential implications in terms of designing genre-specific tools to support creators, while opening doors for research on visual content-based micro communities.

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