

# Using Social Media to determine Popularity of a Place

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## Introduction

Location information, when combined with data-analytics and city demographics, has tremendous potential to tap into the pulse of the city and thereby improve the quality of life for citizens. The results of the current project would add value to research in the following areas of a smart city project: business growth, smart disaster management, managing tourist experience and improvement of travel experience. The research question for our project is, understanding whether social media sources can be used as a way to measure the popularity of a place?

## Related Work

In [1], the researcher focuses on determining the features related of images shared on Flickr that determine its popularity. It does this by trying to predict the number of likes and views received by a photograph before it is uploaded on social media. Two key features related to an image are analyzed that according to the researcher affects the popularity of an image, namely the content and the social context. The content of the image consists of features like gist, texture, color patches and gradient whereas the context consists of features like mean views, count of photographs shared by the user, contacts, groups and group members. Using a dataset consisting of about 2.3 million images from Flickr, the researchers concluded that the normalized view count of images can be reliably predicted with a rank correlation of 0.81 using both image content and social cues. The research paper focuses on the content and context of the photograph but in contrast to this we plan to focus on the number of likes and the count of photographs of a place to predict the popularity of a place.

As discussed in [2], Social media outlets constitute excellent vehicles for fostering relationships with customers. Liking and commenting on brand posts reflects brand post popularity. Namely, vivid and interactive brand post characteristics enhance the number of likes. Moreover, the share of positive comments on a brand post is positively related to the number of likes. From this it was proved that as a post for a brand gets popular, the number of likes and comments (positive or negative) increase. We hope to find that the inverse of this holds true, that is if increased user engagement can make a post more popular which in turn could boost the popularity of the brand. If this principle holds true, then can this context be used to determine the popularity of a place.

The research in [3] aims to understand what influences Facebook and Twitter users to 'like' or 'follow' bands and artists on social media. It centers on the behavior and psychology of group norms and social proof to investigate social media metrics as an indication of popularity. This study was completed using an online survey comprising of quantitative research by way of Likert-type questions with a 7-point Likert Scale to rate participant's level of agreement or disagreement to a range of statements. The key findings of the study concluded that social media users consider the number of Facebook page 'likes' or Twitter "followers" a band or artist has indicated their level of popularity but that these numerical metrics alone do not influence users to 'like' or 'follow' a band or artist. Since we can find the direct correlation, we will try to see if the same principle would hold true if we were to apply it for determining the popularity of a place.

Why certain pieces of online content (e.g., advertisements, videos, news articles) more viral than others? This article [4], takes a psychological approach to understanding diffusion. Using a unique data set of all the New York Times articles published over a three-month period, the authors examine how emotion shapes virality. The results indicate that

positive content is more viral than negative content, but the relationship between emotion and social transmission is more complex than valence alone. Virality is partially driven by physiological arousal. Experimental results further demonstrate the causal impact of specific emotion on transmission and illustrate that it is driven by the level of activation induced. Taken together, these findings shed light on why people share content and how to design more effective viral marketing campaigns. This paper helps us understand how emotional factors come into play, contributing towards the popularity of online content.

## Dataset

The proposed approach for the project involves aggregating data from multiple social media platforms, namely Facebook, Twitter, Flickr, and Foursquare to form one final dataset. We plan to extract the features from these sources that according to us are directly or indirectly related to the popularity of a place. The APIs and the features extracted using them are listed below for each of the social media platforms:

1. Facebook (Graph API)
  - a. Number of Check-in
  - b. Rating Count
  - c. Fan Count
  - d. Talking About
2. Twitter (Tweepy)
  - a. Number of Tweets
  - b. Number of Followers
  - c. Number of Likes
3. Flickr (Flickr API)
  - a. Number of Likes
  - b. Count of Photos
4. Foursquare (Foursquare API)
  - a. Number of Check-in
  - b. User Count
  - c. Tip Count
  - d. Visit Count

We plan to collect data for different types of places such as national parks, restaurants, beaches, and monuments. The ground truth for the dataset would be determined by including the rankings for the corresponding record from various trustworthy websites.

## Planned Approach

The first step in the planned approach for the project would be brainstorming the techniques to be implemented for data collection from various sources. The method varies a lot from direct pulling data from the API or aggregating the data

over each object in a given time frame. There is a lot of manual work which goes into the data collection activity, as for each place, we have multiple objects available, and we need to identify which of those objects needs to be considered. For each API, we need to manually find the object ID which in most cases is embedded in the URL.

The entities vary for different social media platforms as the place can have a Facebook page with all the features to be extracted whereas for a source like twitter, the first step would be collecting tweets either based on the content of the tweet or the location from which it was tweeted and then aggregating this data to convert it into a single meaningful record.

## References

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- [4] Berger, J. et al., 2012. What Makes Online Content Viral? Journal of Marketing Research.