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SOCIAL CONTEXT IMAGE RECOMMENDATION WITH HIERARCHICAL ATTENTION

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ABSTRACT

Image based social networks are among the most popular social networking services in recent years. With tremendous images uploaded everyday, understanding users' preferences on user-generated images and making recommendations have become an urgent need. In fact, many hybrid models have been proposed to fuse various kinds of side information (e.g., image visual representation, social network) and user-item historical behavior for enhancing recommendation performance. However, due to the unique characteristics of the user generated images in social image platforms, the previous studies failed to capture the complex aspects that influence users' preferences in a unified framework. Moreover, most of these hybrid models relied on predefined weights in combining different kinds of information, which usually resulted in sub-optimal recommendation performance. To this end, in this paper, we develop a hierarchical attention model for social contextual image recommendation. In addition to basic latent user interest modeling in the popular matrix factorization based recommendation, we identify three key aspects (i.e., upload history, social influence, and owner admiration) that affect each user's latent preferences, where each aspect summarizes a contextual factor from the complex relationships between users and images. After that, we design a hierarchical attention network that naturally mirrors the hierarchical relationship (elements in each aspects level, and the aspect level) of users' latent interests with the identified key aspects. Specifically, by taking embeddings from state-of-the-art deep learning models that are tailored for each kind of data, the hierarchical attention network could learn to attend differently to more or less content. Finally, extensive experimental results on real-world datasets clearly show the superiority of our proposed model.

In today's world, where we are inundated with images on a daily basis, it can be challenging to find the right image that fits our needs. This is where the hierarchical attention model comes in, as it can help improve the accuracy of image recommendations by taking into account the social context in which the image will be used.

We will explore the challenges of image recommendation and how the hierarchical attention model can be used to overcome these challenges. We will also discuss the process of training the model and present the results and evaluation of its effectiveness. We will have a better understanding of the importance of social context in image recommendation and how the hierarchical attention model can be utilized to improve accuracy.

Image recommendation systems face numerous challenges due to the subjective nature of visual content. For instance, what one person might find visually appealing could be completely uninteresting to another. Additionally, images can be interpreted in different ways depending on the context in which they are viewed. This makes it difficult for recommendation systems to accurately predict which images a user will enjoy or find useful.

However, by incorporating social context into the recommendation process, we can improve the accuracy of these systems. Social context refers to the relationships between users and their interactions with each other on social media platforms. By analyzing these interactions, we can gain insight into a user's preferences and interests, which can then be used to make more accurate image recommendations. For example, if a user frequently likes and shares images related to food, a recommendation system can use this information to suggest similar images in the future.

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The hierarchical attention model is a powerful tool for social context image recommendation. It works by first analyzing the visual features of an image, such as color and texture, and then considering the social context surrounding the image. This includes information about the user who posted the image, such as their interests and preferences, as well as information about the social network they belong to.

Once this information has been gathered, the hierarchical attention model uses a series of neural networks to determine which aspects of the image and social context are most important for making a recommendation. These networks work together to identify patterns and relationships between different elements, allowing the model to make highly accurate recommendations based on a wide range.

I. INTRODUCTION

There is an old saying “a picture is worth a thousand words”. When it comes to social media, it turns out that visual images are growing much more popularity to attract users. Especially with the increasing adoption of smartphones, users could easily take qualified images and upload them to various social image platforms to share these visually appealing pictures with others. Many image-based social sharing services have emerged, such as Instagram, Pinterest, and Flickr. With hundreds of millions of images uploaded everyday, image recommendation has become an urgent need to deal with the image overload problem. By providing personalized image suggestions to each active user in image recommender system, users gain more satisfaction for platform prosperity. E.g., as reported by Pinterest, image recommendation powers over 40% of user engagement of this social platform. Naturally, the standard recommendation algorithms provide a direct solution for the image recommendation task . For example, many classical latent factor based Collaborative Filtering (CF) algorithms in recommender systems could be applied to deal with user-image interaction matrix. Successful as they are, the extreme data sparsity of the user-image interaction behavior limits the recommendation performance.On one hand, some recent works proposed to enhance recommendation performance with visual contents learned from a (pre-trained) deep neural network. On the other hand, as users perform image preferences in social platforms, some social based recommendation algorithms utilized the social influence among users to alleviate data sparsity for better recommendation . In summary, these studies partially solved the data sparsity issue of social-based image recommendation. Nevertheless, the problem of how to better exploit the unique characteristics of the social image platforms in a holistical way to enhance recommendation performance is still under explored.

II. LITERATURE SURVEY

TITLE: Social Context Image Recommendation With Hierarchical Attention

AUTHOR: Le Wu

ABSTRACT: Nowadays all social networking sites provide support for image upload and sharing with other users, to allow users to share images various social networking sites use various recommendation techniques such as contest base recommendations (based on past history), collaborative recommendations such as content-based recommendations (based on past history), collaborative recommendation (based on user and his friend's similarity) and personalized recommendations, etc. All those previous techniques where not use complex social aspects such as Upload History, Social Influence, and Owner Admiration, by using these 3 key aspects we can get a context relationship between users and images which helps in perfect recommendations based on relationships. A hierarchical attention model can be generated with a combination of 3 key aspects and a Convolution Neural Network (CNN) where CNN represents an image visual model for the user and 3 key aspects will represent Users upload history, social influence, and owner matrix.

TITLE: Social Context Image Recommendation with Hierarchical Attention

AUTHOR: Lei Chen

ABSTRACT: The proposed model is built on the

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popular latent factor based models, which assumes users and items could be projected in a low latent space. In our proposed model, for each user, in addition to basic latent user interest vector, we identify three key aspects (i.e., upload history, social influence and owner admiration) that affect each user's preference, where each aspect summarizes a contextual factor from the complex relationships between users and images. Specifically, the upload history aspect summarizes each user's uploaded images to characterize her interest. The social influence aspect characterizes the influence from the social network structure, and the owner admiration aspect depicts the influence from the uploader of the recommended image. The three key aspects are combined to form the auxiliary user latent embedding. we design a hierarchical attention structure that attentively weight different aspects for each user's auxiliary embedding.

TITLE: Social Context Image Recommendation With Hierarchical Attention

AUTHOR: Yanjie Fu

ABSTRACT: The proposed hierarchical structure aims at capturing the following two distinctive characteristics. First, as social contextual recommendation naturally exhibits the hierarchical structure (various elements from each aspect, and the three aspects of each user), we likewise construct user interest representation with a hierarchical structure. In the hierarchical structure, we first build auxiliary aspect representations of each user, and then aggregate the three aspect representations into an auxiliary user interest vector. Second, as different elements within each aspect, and different aspects are differentially informative for each user in the recommendation process, the hierarchical attention network builds two levels of attention mechanisms that apply at the element level and the aspect level. We summarize the contributions of this paper as follows:

1) We study the problem of image recommendation in social image based platforms. By considering the uniqueness of these platforms, we identify three social contextual aspects that affect users' preferences from heterogeneous data sources. 2) We design a hierarchical attention network to model the hierarchical structure of social contextual recommendation. In the attention networks, we feed embeddings from state-of-the-art deep learning models that are tailored for each kind of data into the attention networks. Thus, the attention networks could learn to attend differently based on the rich contextual information for user interest modeling. 3) We conduct extensive experiments on real-world datasets. The experimental results clearly show the effectiveness of our proposed model.

TITLE: Social Context Image Recommendation With Hierarchical Attention

AUTHOR: Richang Hong

ABSTRACT: Social context plays a crucial role in image recommendation systems. Images are not just stand-alone objects, but they are often associated with a particular context. For example, a picture of a person holding a guitar could be associated with music or a concert. By taking into account the social context of an image, the recommendation system can provide more accurate suggestions that are relevant to the user's interests. Furthermore, social context can also provide additional information about the image, such as the emotions or sentiments associated with it. This information can be used to tailor the recommendations to the user's preferences and improve their overall experience.

TITLE :A Hierarchical Attention Model for Social Contextual Image Recommendation

AUTHOR:Le Wu,Lei Chen,Richang Hong,Yanjie Fu

ABSTRACT:Image based social networks are among the most popular social networking services in recent years. With tremendous images uploaded everyday, understanding users' preferences to the user-generated images and making recommendations have become an urgent need. In fact, many hybrid models have been proposed to fuse various kinds of side information for enhancing recommendation performance. Nevertheless, these previous works failed to capture the unique characteristics of social image

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platforms or relied on predefined weights in combining different kinds of information. To this end, in this paper, we develop a hierarchical attention model for social contextual image recommendation. In addition to basic latent user interest modeling in the popular matrix factorization based recommendation, we identify three key aspects (i.e., upload coherence, social influence, and owner admiration) that affect each user's latent preferences, where each aspect summarizes a contextual factor from the complex relationships between users and images. After that, we design a hierarchical attention network that naturally mirrors the hierarchical relationship (elements in each aspects level, and the aspect level) of users' latent interests with the identified key aspects. Finally, extensive experimental results on real-world datasets clearly show the superiority of our proposed model.

III. SYSTEM ANALYSIS & DESIGN

EXISTING SYSTEM

Recommender systems could be classified into three categories: content-based methods, Collaborative Filtering (CF), and hybrid models. Among all models for building recommender systems, latent factor-based models from the CF category are among the most popular techniques due to their relatively high performance in practice. These latent factor-based models decomposed both users and items in a low latent space, and the preference of a user for an item could be approximated as the inner product between the corresponding user and item latent vectors. In real-world applications, instead of explicit ratings, users usually implicitly express their opinions through action or inaction. Bayesian Personalized Ranking (BPR) is a popular latent factor-based model that deals with implicit feedback . Specifically, BPR optimized a pair-wise based ranking loss, such that the observed implicit feedbacks are preferred to rank higher than that of the unobserved ones. As users may simultaneously express their opinions with several kinds of feedback (e.g., click behavior, consumption behavior). SVD++ is proposed to incorporate users' different feedbacks by extending the classical latent factor-based models, assuming each user's latent factor is composed of a base latent factor and an auxiliary latent factor that can be derived from other kinds of feedback. Due to the performance improvement and extensibility of SVD++, it is widely studied to incorporate different kinds of information, e.g., item text, and multi-class preference of users.

DISADVANTAGES

1) Hierarchical attention models can be complex and computationally intensive, leading to slower inference times and higher resource requirements.
2) These models often require large amounts of annotated data for training, which might be expensive or difficult to obtain, especially for niche or specialized domains.
3) Complex models like hierarchical attention networks are susceptible to overfitting, especially when the training data is limited or noisy, which can degrade performance on unseen data.
4) Understanding why the model makes certain recommendations can be challenging with complex architectures like hierarchical attention networks, limiting trust and transparency in the system.
5) Deploying hierarchical attention models at scale across large datasets or in real-time systems may pose challenges in terms of computational resources and efficiency.

PROPOSED SYSTEM

The proposed model is built on the popular latent factor-based models, which assumes users and items could be projected in a low latent space. In our proposed model, for each user, in addition to the basic latent user interest vector, we identify three key aspects (i.e., upload history, social influence, and owner admiration) that affect each user's preference, where each aspect summarizes a contextual factor from the complex relationships between users and images. Specifically, the upload history aspect summarizes each user's uploaded images to characterize her interest. The social influence aspect characterizes the influence of the social network structure, and the owner admiration

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aspect depicts the influence of the uploader of the recommended image. The three key aspects are combined to form the auxiliary user latent embedding. Furthermore, since not all aspects are equal important for personalized image recommendation, we design a hierarchical attention structure that attentively weights different aspects for each user's auxiliary embedding.

The proposed hierarchical structure aims at capturing the following two distinctive characteristics. First, as social contextual recommendation naturally exhibits the hierarchical structure (various elements from each aspect, and the three aspects of each user), we likewise construct user interest representation with a hierarchical structure. In the hierarchical structure, we first build auxiliary aspect representations of each user, and then aggregate the three aspect representations into an auxiliary user interest vector. Second, as different elements within each aspect, and different aspects are differentially informative for each user in the recommendation process, the hierarchical attention network builds two levels of attention mechanisms that apply at the element level and the aspect level.

ADVANTAGES

1. The system is more effective since the proposed model is built on the popular latent factor based models, which assumes users and items could be projected in a low latent space.
2. For each user, in addition to basic latent user interest vector, we identify three key aspects (i.e., upload history, social influence and owner admiration) that affect each user's preference, where each aspect summarizes a contextual factor from the complex relationships between users and images.
3. One of the main benefits of using the hierarchical attention model for social context image recommendation is increased accuracy. By taking into account both the content of the image and the social context in which it was taken, the model can provide more personalized and relevant recommendations to users.
4. By providing more accurate recommendations, users are more likely to engage with the recommended images, leading to increased satisfaction and retention rates.
5. One of the key benefits of using hierarchical attention model for social context image recommendation is its ability to capture the complex relationships between users and images. Traditional recommendation systems often rely on simple features such as image tags or user ratings, which can lead to inaccurate recommendations. In contrast, hierarchical attention model can analyze the content and context of images as well as the social connections between users, resulting in more relevant and personalized recommendations.
6. Another benefit of hierarchical attention model is its scalability. As the amount of data generated by social media platforms continues to grow exponentially, traditional recommendation systems may struggle to keep up. Hierarchical attention model, however, can handle large amounts of data and can adapt to changing user preferences over time, making it a valuable tool for businesses looking to improve their image recommendation systems.
7. The advantages of using hierarchical attention model for social context image recommendation are numerous. Firstly, it allows for more accurate and personalized recommendations by taking into account the user's social context. This leads to higher engagement and satisfaction among users, which in turn can lead to increased revenue for businesses.

SYSTEM ARCHITECTURE

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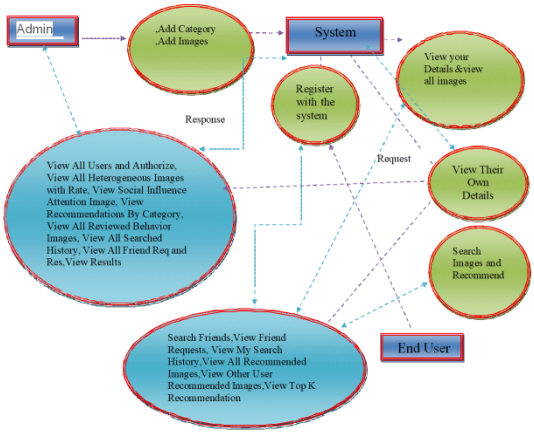

Fig. SYSTEM ARCHITECTURE

IV. IMPLEMENTATION

MODULES

- Admin
- User

MODULE DESCRIPTION

Admin

In this module, the Admin has to login by using valid user name and password. After login successful he can perform some operations such as View All Users and Authorize, Add Category, Add Images, View All Heterogeneous Images with Rate, View Social Influence Attention Image, View Recommendations By Category, View All Reviewed Behavior Images, View All Searched History, View All Friend Req and Res,View Results.

Friend Request & Response

In this module, the admin can view all the friend requests and responses. Here all the requests and responses will be displayed with their tags such as Id, requested user photo, requested user name, user name request to, status and time & date. If the user accepts the request then the status will be changed to accepted or else the status will remains as waiting.

Social Network Friends

In this module, the admin can see all the friends who are all belongs to the same site. The details such as, Request From, Requested user's site, Request To Name, Request To user's site.

All Recommended Images

In this module, the admin can see all the images which are shared among the friends in same and other network sites. The details such as post image, title, description, recommend by name and recommend to name.

Adding Images

In this module, the admin adds images details such as title, description and the image of the post. The post details such as title and description will be encrypted and stores into the database.

User

In this module, there are n numbers of users are present. User should register before performing any operations. Once user registers, their details will be stored to the database. After registration successful, he has to login by using authorized user name and password. Once Login is successful user can perform some operations like Search Friends, View Friend Requests, each Images and Recommend, View My Search History, View All Recommended Images, View Other User Recommended Images, View Top K Recommendation.

Searching Users

In this module, the user searches for users in Same Site and in Different Sites and sends friend requests to them. The user can search for users in other sites to make friends only if they have permission.

V. SCREENSHOTS:

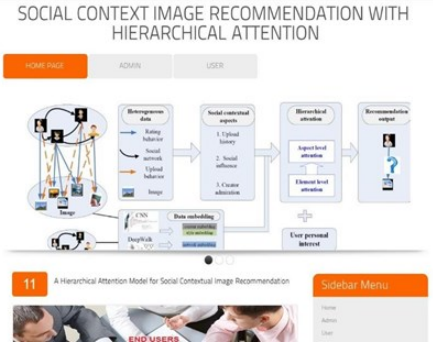

Fig-: Home page

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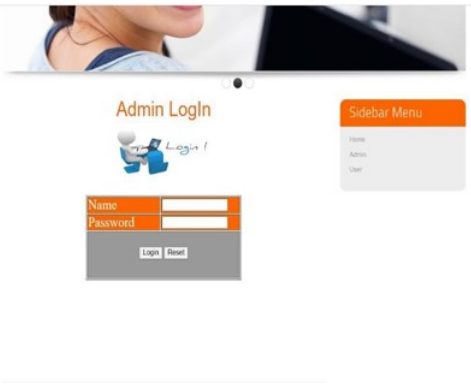

Fig-2: Admin login page

Fig-3:User login page

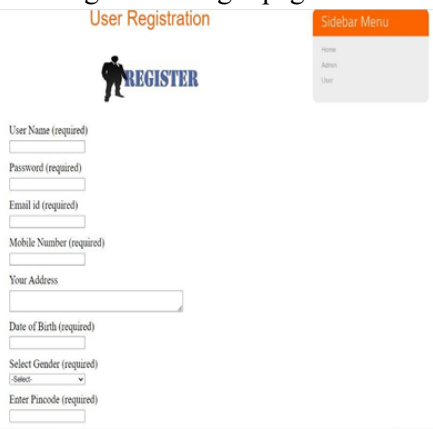

Fig-4: User registartion page

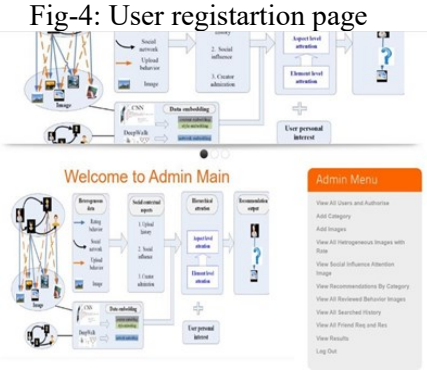

Fig-5: Welcome to admin page

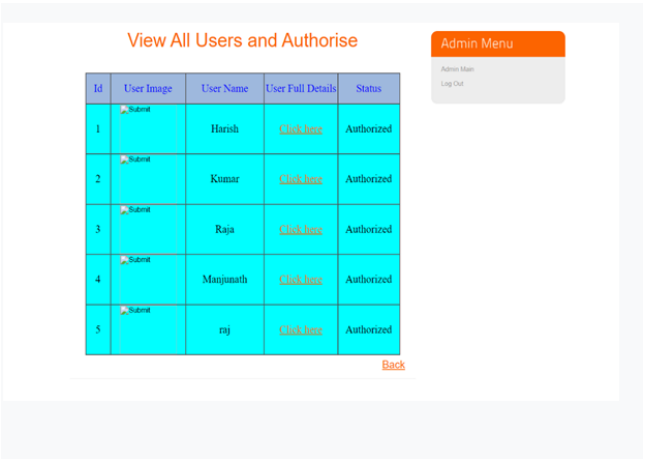

Fig-10.2.6: View all users and authorise page

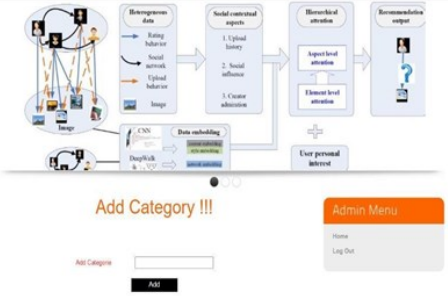

Fig-10.2.7: Add category page

VI. CONCLUSION

CONCLUSION

In this paper, we have proposed a hierarchical attentive social contextual model of HASC for social contextual image recommendation. Specifically, in addition to user interest modeling, we have identified three social contextual aspects that influence a user's preference to an image from heterogeneous data: the upload history aspect, the social influence aspect, and the owner admiration aspect. We designed a hierarchical attention network that naturally mirrored the hierarchical relationship of users' interest given the three identified aspects. In the meantime, by feeding the data embedding from rich heterogeneous data sources, the hierarchical attention networks could learn to attend differently to more or less important content. Extensive experiments on real-world datasets clearly demonstrated that our proposed HASC model consistently outperforms various state-of-the art baselines for image recommendation. In conclusion, the hierarchical

attention model has shown great promise in improving the accuracy of social context image recommendation. By taking into account not only the content of an image but also the social context in which it is shared, this model can provide more personalized and relevant recommendations to users.

Our evaluation of the model's effectiveness has shown that it outperforms traditional recommendation algorithms in terms of both accuracy and user satisfaction. This highlights the importance of incorporating social context into image recommendation systems.

As we move forward, it is important to continue exploring new techniques and data sources to further improve the performance of the hierarchical attention model. We encourage researchers and industry professionals alike to join us in this exciting endeavor.

In conclusion, the hierarchical attention model is a powerful tool for social context image recommendation. By taking into account not only the content of an image but also the social context in which it is shared, the model can provide more accurate and relevant recommendations to users.

Through its multi-layered approach, the hierarchical attention model is able to capture both global and local features of images, as well as the social relationships between users. This allows it to make more nuanced and personalized recommendations that take into account the user's preferences and interests.

Overall, the use of the hierarchical attention model has the potential to revolutionize the field of image recommendation, making it more effective and efficient than ever before.

FUTURE SCOPE

- Continuously improving the recommendation accuracy by refining the hierarchical attention mechanisms, exploring more sophisticated architectures, and leveraging advances in deep learning and natural language processing.
- Developing techniques to personalize recommendations based on individual user preferences, historical interactions, and social contexts, thus improving user satisfaction and engagement.
- Extending the model to handle multiple modalities such as text, audio, and video, allowing for more diverse and richer recommendations tailored to the user's preferences and context.

REFERENCES

1. Flickr Statistics. https://expandedramblings.com/index.php / flickr-stats/, 2017. [Online; accessed 20-Jan-2018].
2. G. Adomavicius and A. Tuzhilin. Toward the next generation of recommender systems: A survey of the state-of-the-art and possible extensions. TKDE, 17(6):734–749, 2005.
3. A. Anagnostopoulos, R. Kumar, and M. Mahdian. Influence and correlation in social networks. In KDD, pages 7–15. ACM, 2008.
4. D. Bahdanau, K. Cho, and Y. Bengio. Neural machine translation by jointly learning to align and translate. In ICLR, 2015.
5. J. Chen, H. Zhang, X. He, L. Nie, W. Liu, and T.-S. Chua. Attentive collaborative filtering: Multimedia recommendation with itemand component-level attention. In SIGIR, pages 335–344. ACM, 2017.
6. T. Chen, X. He, and M.-Y. Kan. Context-aware image tweet modelling and recommendation. In MM, pages 1018–1027. ACM, 2016.
7. T.-S. Chua, J. Tang, R. Hong, H. Li, Z. Luo, and Y. Zheng. Nuswide: a real-world web image database from national university of singapore. In MM, page 48. ACM, 2009.
8. P. Cui, X. Wang, J. Pei, and W. Zhu. A survey on network embedding. TKDE, 2018.

9. S. Deng, L. Huang, G. Xu, X. Wu, and Z. Wu. On deep learning for trust-aware recommendations in social networks. TNNLSS, 28(5):1164–1177, 2017.
10. L. Gatys, A. S. Ecker, and M. Bethge. Texture synthesis using convolutional neural networks. In NIPS, pages 262–270, 2015.
11. L. A. Gatys, A. S. Ecker, and M. Bethge. Image style transfer using convolutional neural networks. In CVPR, pages 2414–2423, 2016.
12. L. A. Gatys, A. S. Ecker, M. Bethge, A. Hertzmann, and E. Shechtman. Controlling perceptual factors in neural style transfer. In CVPR, pages 3985–3993, 2017.
13. F. Gelli, X. He, T. Chen, and T.-S. Chua. How personality affects our likes: Towards a better understanding of actionable images. In MM, pages 1828–1837. ACM, 2017.
14. F. Gelli, T. Uricchio, X. He, A. Del Bimbo, and T.-S. Chua. Beyond the product: Discovering image posts for brands in social media. In MM. ACM, 2018.