A survey on Filtering Annoying Posts From OSN User Walls

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Abstract— *One of the most essential issue in today's Online Social Networks (OSNs) is to provide users the ability to have full control on the messages which are showed on their own secretive space to avoid that unwanted content is which is being displayed. Till the date, OSNs provide little support to this requirement. To fill the gap, we suggest a system that permitting all the OSN users to have a direct access control on the messages displayed on their walls in social networks. Spamming remains parsimoniously feasible because promoters have no operating costs beyond the management of their mailing lists, and it is difficult to hold senders responsible for their mass mailings. Because the barrier to entry is so low, spammers are numerous, and the volume of unsolicited mail has become very high. This is achieved through a flexible rule-based system, that allows users to customize the filtering criteria to be applied to their walls, and a Machine Learning-based soft classifier automatically labeling messages in support of content-based filtering.*

Index Terms—Online social networks, information filtering, short text classification, policy-based personalization.

1. INTRODUCTION

Today ONLINE Social Networks (OSNs) are one of the highest popular interactive medium to central into sharing, communication and broadcast a substantial amount of human and social life information. Every day and nonstop unbroken communications implies the discussion on quite a lot of types of content, that could be include free text messages, different image, audio, and video data. According to Facebook measurements normal user generates 90 portions of information each month, although more than 30 billion pieces of information (different web links,

news stories, messages, blog posts, notes, photograph albums, etc.) are shared each month. The large and dynamic informational data creates the proposition for the service of web content mining approaches that to automatically determine beneficial information within the data. They are related to offer the active establishment in complex, simple and sophisticated tasks

which are involved in OSN, such as for instance access control or information filtering. Information filtering has been greatly discovered for what concerns word-based documents and recently web content. On the other hand, the main aim of the bulk of these proposals is predominantly to deliver users a classification mechanism to avoid they are overcome by useless data. In OSNs, information filtering can be also used for a different sensitive work or purpose depends on the user's requirement. This is due to the circumstance that in OSNs there is the general walls on which possibility of posting or commenting other posts on particular public/private areas. Information filtering can be used to give users the ability to automatically control the messages written on their own walls, by filtering out unwanted messages. We believe that this is a key OSN service that has not been provided so far. Indeed, today OSNs provide very little support to prevent unwanted messages on user walls. For example, Facebook allows users to state who is allowed to insert messages in their walls (i.e., friends, friends of friends, or defined groups of friends). However, no content-based preferences are supported and therefore it is not possible to prevent undesired messages, such as political or vulgar ones, no matter of the user who posts them. Providing this service is not only a matter of using previously defined web content mining techniques for a different application, rather it requires to design ad hoc classification strategies. This is because wall messages are constituted by short text for which traditional classification methods have serious limitations since short texts do not provide sufficient word occurrences. The aim of the present work is therefore to propose and experimentally evaluate an automated system, called Filtered Wall (FW), able to filter unwanted messages from OSN user walls. We exploit Machine Learning (ML) text categorization techniques to automatically assign with each short text message a set of categories based on its content.

II RELATED WORK

The main contribution of this paper is the design of a system providing customizable content-based message filtering for OSNs, based on ML techniques. As we have pointed out in the introduction, to the best of our knowledge, we are the first proposing such kind of application for OSNs. However, our work has relationships both with the state of the art in content-based filtering, as well as with the field of policy-based personalization for OSNs and, more in general, web

contents. Therefore, in what follows, we survey the literature in both these fields.

2.1 Content-Based Filtering

Information filtering systems are designed to classify a stream of dynamically generated information dispatched asynchronously by an information producer and present to the user those information that are likely to satisfy his/her requirements.

In content-based filtering, each user is assumed to operate independently. As a result, a content-based filtering

System selects information items based on the correlation between the content of the items and the user preferences as opposed to a collaborative filtering system that chooses items based on the correlation between people with similar preferences. While electronic mail was the original domain of early work on information filtering, subsequent papers have addressed diversified domains including newswire articles, Internet "news" articles, and broader network resources. Documents processed in content-based filtering are mostly textual in nature and this makes content-based filtering close to text classification. The activity of filtering can be modeled, in fact, as a case of single label, binary classification, partitioning incoming documents into relevant and non-relevant categories. Content-based filtering methods are based on a description of the item and a profile of the user's preference. In a content-based recommender system, keywords are used to describe the items; beside, a user profile is built to indicate the type of item this user likes. In other words, these algorithms try to recommend items that are similar to those that a user liked in the past (or is examining in the present). In particular, various candidate items are compared with items previously rated by the user and the best-matching items are recommended. This approach has its roots in information retrieval and information filtering research. The system creates a content-based profile of users based on a weighted vector of item features. The weights denote the importance of each feature to the user and can be computed from individually rated content vectors using a variety of techniques. Simple approaches use the average values of the rated item vector while other sophisticated methods use machine learning techniques.

Content-based filtering is mainly based on the use of the ML paradigm according to which a classifier is automatically induced by learning from a set of pre classified examples. A remarkable variety of related work has recently appeared, which differ for the adopted

feature extraction methods, model learning, and collection of samples. The feature extraction procedure maps text into a compact representation of its content and is uniformly applied to training and generalization phases. Several experiments prove that Bag-of-Words (BoW) approaches yield good performance and prevail in general over more sophisticated text representation that may have superior semantics but lower statistical quality. As far as the learning model is concerned, there are a number of major approaches in content-based filtering and text classification in general showing mutual advantages and disadvantages in function of application dependent issues.

2.2 Policy-Based Personalization of OSN Contents

In recent times, there have been some suggestions to take advantage of classification devices for personalizing access in OSNs. A classification method has been proposed to classify as short text messages in order to avoid over whelming users of micro blogging services by raw informational data. The system described is focuses on social network and links a set of categories with each post describing its content. The user can then view only certain types of tweets based on his/her interests. OSN trust relationships and provenance information to personalize access to the website. However, such systems do not provide a filtering policy layer by which the user can exploit the result of the classification process to decide how and to which extent filtering out unwanted information. In contrast, our filtering policy language allows the setting of FRs according to a variety of criteria, that do not consider only the results of the classification process but also the relationships of the wall owner with other OSN users as well as information on the user profile.

III SYSTEM ARCHITECTURE

The architecture of OSN services is a three layer structure as shown in figure. The first layer, called Social Network Manager (SNM), commonly aims to provide the basic OSN functionalities (i.e., profile and relationship management), whereas the second layer provides the support for external Social Network Applications (SNAs) having the datset. According to this reference architecture, the proposed system is placed in the second and third layers which contains GUI and the filtered wall.
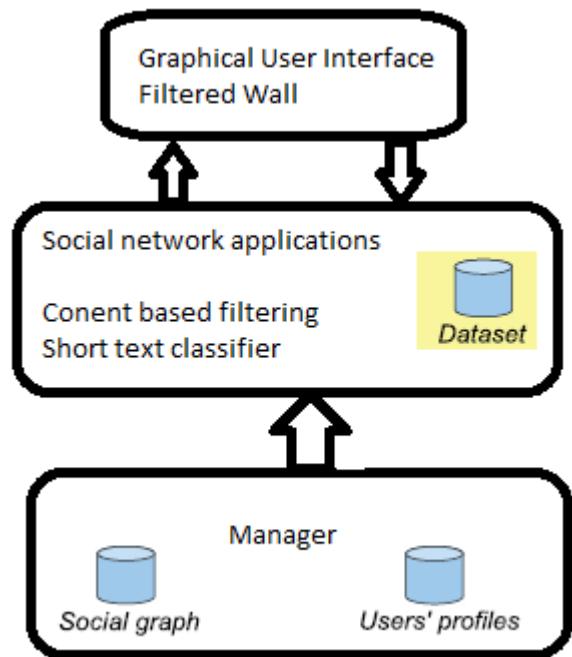

Fig: Filtered wall architecture

As graphically figure shows filtered wall architecture, the path followed by a message shortened as follows:
1. After entering the private wall of one of his/her contacts, the user tries to post a message, which is intercepted by FW.
2. A ML-based text classifier extracts metadata from the content of the message.
3. FWuses metadata provided by the classifier, together with data extracted from the social graph and users' profiles, to enforce the filtering and BL rules.
4. Depending on the result of the previous step, the message will be published or filtered by FW.

IV CONCLUSIONS

The system to filter undesired unwanted messages from OSN walls customizable content-dependent. The early encouraging results we have obtained on the classification procedure prompt us to continue with other work that will aim to improve the quality of classification. In particular, future plans contemplate a deeper analysis on two inter dependent tasks. The first concerns the withdrawal and/ or selection of contextual features. The second task includes the learning phase. Since the fundamental domain is dynamically changing, the collection of pre categorized data may not be demonstrative in the longer term. In future work author plan to discourse this problem by investigating the use of online learning paradigms able to include label feedbacks from users. Additionally, plan to enhance our system with a more sophisticated approach to decide when a user

should be inserted. The system proposed in this paper represents just the core set of functionalities needed to provide a sophisticated tool for OSN message filtering. Even if we have complemented our system with an online assistant to set FR thresholds, the development of a complete system easily usable by average OSN users is a wide topic which is out of the scope of the current paper. As such, the developed Facebook application is to be meant as a proof-of-concepts of the system core functionalities, rather than a fully developed system.

V ACKNOWLEDGMENT

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