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MENTAL DISORDER DETECTION VIA SOCIAL MEDIA ANALYSIS

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Abstract: In today’s world, it is undeniable that social media plays an important role in impacting our culture, our economy and our overall view of the world. Social media is a new forum that brings people to exchange idea, connect with, relate to, and mobilize for a cause, seek advice, and offer guidance. Most research on social network mining focuses on discovering the knowledge behind the data for improving people’s life. While OSNs seemingly expand their user’s capability in increasing social contacts, they may actually decrease the face-to-face interpersonal interactions in the real world. Due to the epidemic scale of these phenomena, new terms such as Phubbing (Phone Snubbing) and Nomo phobia (No Mobile Phone Phobia) have been created to describe those who cannot stop using mobile social networking apps. Some social network mental disorders (MDDSMAs), Journal of Psychiatry have reported that excessive use, depression, social withdrawal, and a range of other negative repercussions. We propose a machine learning framework, namely, Social Network Mental Disorder Detection (MDDSMAD) that exploits features extracted from social network data to accurately identify potential cases of MDDSMAs. We also exploit multi-source learning in MDDSMAD and propose a new MDDSMA-based Tensor Model (STM) to improve the accuracy. We can find out the stressed users on social media platforms.

I INTRODUCTION

In today's world, it is undeniable that social media plays an important role in impacting our culture, our economy and our overall view of the world. Social media is a new forum that brings people to exchange idea, connect with, relate to, and mobilize for a cause, seek advice, and offer guidance. Most research on social network mining focuses on discovering the knowledge behind the data for improving people’s life.

We extract and analyze the following crucial categories of features from OSNs: 1) Social Comparison 2) Social Structure 3) Social Diversity 4) Parasocial Relationships 5) Online and Offline Interaction Ratio 6) Social Capital 7) Disinhibition 8) Self-Disclosure 9) Bursting Temporal Behavior.

These features capture important factors or serve as proxies for MDDSMA detection. For example, studies manifest that users exposed to positive posts from others on Facebook with similar background are inclined to feel malicious envy and depressed due to the social comparison.

II LITERATURE SURVEY

[1] Rony Germon, Karina Sokolova, “Analyzing User Generated Content on Instagram: the Case of Travel Agencies”. This paper has described our first exploratory study on the indicators of Instagram communication success and on the role of user-generated content on community engagement. We analyzed Instagram images with different engagement levels produced by online travel agencies. We observed that UGC has a higher success for the online travel agencies community than for specially created images, and that is especially the case with AirBnB. The most engaging photographs depicted landscapes and contained calls for action in the description: calls such as like, retweet or comment. The most successful content came from Instagram users or, more often, from non Instagram bloggers sharing their experiences. Although our current dataset is limited, it already shows the importance of user-generated content in community management on Instagram.

[2] Liang Zhao, “Hierarchical Incomplete Multi-source Feature Learning for Spatiotemporal Event Forecasting”. In this paper, significant societal event is prevalent in multiple

aspects of society, e.g., economics, politics, and culture. To accommodate all the intricacies involved in the underlying domain, event forecasting should be based on multiple data sources but existing models still suffer from several challenges. This paper has proposed a novel group-Lasso-based feature learning model that characterizes the feature dependence, feature sparsity, and interactions among missing values. An efficient algorithm for parameter optimization is proposed to ensure global optima. Extensive experiments on 10 real-world datasets with multiple data sources demonstrated that the proposed model outperforms other comparison methods in different ratios of missing values.

[3] Animashree Anandkumar, “Learning Over complete Latent Variable Models through Tensor Methods”. In this paper, we provide guarantees for learning latent variable models emphasizing on the over complete regime, where the dimensionality of the latent space exceeds the observed dimensionality. In particular, we consider multiview mixtures, ICA, and sparse coding models. Our main tool is a new algorithm for tensor decomposition that works in the over complete regime. In the semi-supervised setting, we exploit label information to get a rough estimate of the model parameters, and then refine it using the tensor method on unlabeled samples. We establish learning guarantees when the number of components scales as $k = o(d p/2)$, where d is the observed dimension, and p is the order of the observed moment employed in the tensor method (usually $p = 3, 4$).

[4] Katarzyna Wegrzyn Wolska, “Explore the Effects of Emoticons on Twitter Sentiment Analysis”. In this paper, with the significance of sentiment analysis being recognized and the popularity rate of emoticon in social network getting higher and higher, the role of emoticon cannot be ignored on polarity classification. Our key contribution in this paper lies in validating the important role emoticon plays in conveying overall sentiment of a text in TSA though a series of experiments. We compare 3 emoticon pre-processing methods and emoticon-weight lexicon method on the base of Twitter aware tokenizer and NB Model. We propose a combination strategy using factor alpha to integrate the Emoticon-Weight Lexicon with classifier. The result shows that the usage of emoticon-weight lexicon model improves the performance of NB model on TSA task. We can get the conclusion that some emoticons dominate the sentiment of a tweet and conquer the emotion of verbal cues.

[5] Tanvi Hinge, “Identify the Deception of the Social Network to Investigate the Relationship between Dependence and Data Mining From Social Networks”. In this paper, we try to automatically identify potential users online with MDDSSMA. We propose a MDDSSMAD framework that explores various features of an OSN’s data records for MDDSSMA detection. This work represents a collaborative effort between computer scientists and mental health

researchers to address the emerging problems in the MDDSSMA.

[6] Animashree Anandkumar, “When Are Over complete Topic Models Identifiable? Uniqueness of Tensor Tucker Decompositions with Structured Sparsity”. In this Paper, over complete latent representations have been very popular for unsupervised feature learning in recent years. In this paper, we specify which over complete models can be identified given observable moments of a certain order. We consider probabilistic admixture or topic models in the over complete regime, where the number of latent topics can greatly exceed the size of the observed word vocabulary. While general over complete topic models are not identifiable, we establish generic identifiability under a constraint, referred to as topic persistence. Our sufficient conditions for identifiability involve a novel set of higher order expansion conditions on the topic-word matrix or the population structure of the model. This set of higher-order expansion conditions allow for over complete models, and require the existence of a perfect matching from latent topics to higher order observed words.

III PROPOSED SYSTEM

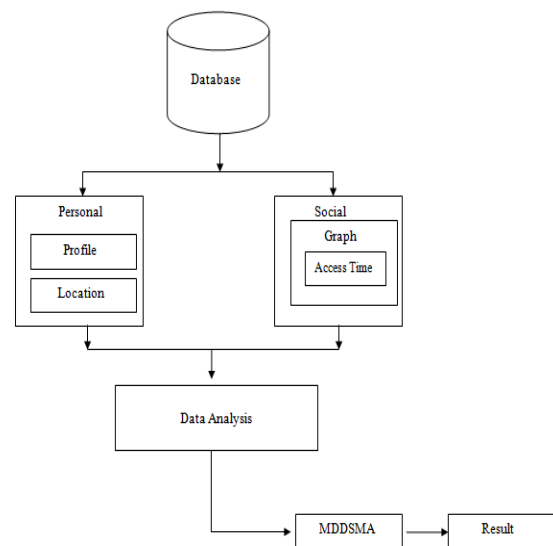


Figure 1: System Architecture

We propose an innovative approach, new to the current practice of MDDSSMA detection, by mining data logs of OSN users as an early detection system. We develop a machine learning framework to detect MDDSSMAs, called Social Network Mental Disorder Detection (MDDSSMAD). We also design and analyze many important features for identifying MDDSSMAs from OSNs, such as disinhibition, parasociality, self-disclosure, etc. The proposed framework can be deployed to provide an early alert for potential patients. We study the multi-source learning problem for MDDSSMA detection. We significantly improve the efficiency and achieve the solution uniqueness by CP decomposition,

and we provide theoretical results on non divergence. By incorporating MDDSMA characteristics into the tensor model, we propose STM to better extract the latent factors from different sources to improve the accuracy. We conduct a user study with 3126 users to evaluate the effectiveness of the proposed MDDSMAD framework. To the best of our knowledge, this is the first dataset crawled online for MDDSMA detection. Also, we apply MDDSMAD on large-scale real datasets, and the results reveal interesting insights on network structures in MDDSMA types, which can be of interest to social scientists and psychologists. We propose STM to better extract the latent factors from different sources to improve the accuracy.

IV CONCLUSION

In this system we propose STM to better extract the latent factors from different sources to improve the accuracy. We conduct a user study with 3126 users to evaluate the effectiveness of the proposed MDDSMAD framework. To the best of our knowledge, this is the first dataset crawled online for MDDSMA detection. Also, we apply MDDSMAD on large-scale real datasets, and the results reveal interesting insights on network structures in MDDSMA types, which can be of interest to social scientists and psychologists. We propose STM to better extract the latent factors from different sources to improve the accuracy

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