2025 Volume: 01 Issue: 05 www.ijrpa.com Research Article

International Journal Research Publication Analysis

Page: 01-05

A COMPREHENSIVE STUDY ON SOCIAL NETWORK MENTAL DISORDERS DETECTION VIA ONLINE SOCIAL MEDIA MINING

***[1]S. Anitha, [2]Guntoju Poojitha, [3]Mukkera Madhu Kiran, [4]Kadiyala Akshitha, [5]G Naveen, [6]J. Srinivas**

[1]Assistant Professor Computer Science and Engineering Sri Indu Institute of Engineering and Technology Affiliated to JNTUH Sheriguda, Ibrahimpatnam, Hyderabad.

[2,3,4,5,6]Computer Science and Engineering Sri Indu Institute of Engineering and Technology Affiliated to JNTUH Sheriguda, Ibrahimpatnam, Hyderabad.

Article Received: 21 August 2025
Article Revised: 11 September 2025
Published on: 01 October 2025

***Corresponding Author: S. Anitha**
Assistant Professor Computer Science and Engineering Sri Indu Institute of Engineering and Technology Affiliated to JNTUH Sheriguda, Ibrahimpatnam, Hyderabad.

ABSTRACT

The widespread use of online social networks has led to the emergence of Social Network Mental Disorders (SNMDs) such as Cyber-Relationship Addiction, Net Compulsion, and Information Overload. Traditional detection methods depend on self-reports and psychological assessments, which are time-consuming and often delayed. This study presents a novel framework—SNMDD—that utilizes online social media behavior mining for early and automated SNMD detection. It integrates multiple features, including social interaction patterns, usage frequency, and content characteristics, using a unique SNMD- based Tensor Model (STM) for multi-source learning. Evaluated on data from 3,126 users, SNMDD demonstrates strong performance in distinguishing SNMD types. The study confirms that behavioral signals from social media can effectively indicate potential mental health issues, enabling timely and scalable mental disorder detection. Additionally, this work provides insights into the correlations between different user behaviors and SNMDs, offering practical implications for clinicians, platform designers, and mental health professionals to better manage and mitigate online behavioral disorders.

Index Terms: Social Network Mental Disorders (SNMDs), Online Social Media Mining, Cyber- Relationship Addiction, Information Overload, Net Compulsion, User Behaviour Modeling, Social Network Analysis, Computational Psychiatry.

INTRODUCTION

The rapid growth and widespread adoption of online social networks have significantly transformed how people communicate, share information, and build relationships. While these platforms offer many social and professional benefits, they also pose psychological risks due to excessive or maladaptive usage. Emerging concerns highlight the rise of Social Network Mental Disorders (SNMDs), a group of behavioral health issues that include Cyber-Relationship Addiction, Net Compulsion, and Information Overload. These disorders are increasingly affecting users' mental well-being, productivity, and social lives.

Traditional approaches to identifying SNMDs rely on self-reported questionnaires or clinical evaluations, which are time-consuming, subjective, and often initiated only after the disorder has progressed significantly. There is a pressing need for automated, scalable, and timely detection methods that can monitor user behavior unobtrusively and alert individuals or professionals to potential risks.

This study presents a novel framework—SNMDD (Social Network Mental Disorder Detection)—that leverages data from users' online behaviors to identify signs of SNMDs. By mining features such as user interaction patterns, content-sharing frequency, social comparisons, and temporal usage trends, the proposed system applies a multi-source learning model—the SNMD-based Tensor Model (STM)—to capture and analyze complex user behaviors across various social platforms. The framework is evaluated on a dataset of 3,126 users, demonstrating its effectiveness in distinguishing between SNMD types and detecting at-risk users with high accuracy.

Literature Survey

The psychological impacts of social media overuse have received growing attention, especially with the emergence of Social Network Mental Disorders (SNMDs) such as Cyber-Relationship Addiction, Net Compulsion, and Information Overload. Traditional detection methods rely on clinical assessments or self-reported questionnaires, which are limited by subjectivity and lack scalability. Early computational studies, like those by De Choudhury et al., explored mental health issues such as depression using social media data, applying sentiment analysis and behavior tracking. However, these efforts often focus on general mental health rather than SNMDs specifically.

Recent machine learning approaches have attempted to analyze user behavior for mental

disorder detection, but they usually overlook the multi-dimensional and temporal aspects of online interactions. Moreover, few distinguish between different SNMD subtypes. This study addresses these gaps by proposing a novel, data-driven framework that utilizes multi-source behavior analysis through a tensor-based model to enable accurate, scalable, and early detection of various SNMDs.

System Analysis

The SNMDD system is structured to detect Social Network Mental Disorders through careful input and output design. Input Design involves collecting user behavior data from platforms like Facebook and Twitter, including posts, likes, login frequency, friend networks, and activity timestamps. These raw inputs are preprocessed—cleaned, normalized, and transformed into structured behavioral features such as emotional tone, social interaction patterns, and temporal usage trends. This data forms the basis for modeling user behavior and identifying signs of SNMDs.

Input Design: The input design of the SNMDD (Social Network Mental Disorder Detection) system focuses on collecting and structuring relevant user data from various online social media platforms such as Facebook, Twitter, and Instagram. Key input parameters include user- generated content (e.g., posts, comments, and shared media), interaction data (likes, replies, friend connections, and messaging frequency), and temporal activity metrics (login times, session duration, and post timestamps). These raw inputs are preprocessed through data cleaning, normalization, and feature extraction to ensure consistency and accuracy.

Output Design: Delivers clear, actionable results. The system outputs a classification label indicating whether a user is affected by SNMDs, along with the specific subtype—Cyber-Relationship Addiction, Net Compulsion, or Information Overload. It also generates risk scores and behavioral summaries to aid mental health professionals or system administrators in monitoring and intervention. Designed for interpretability and efficiency, the SNMDD system ensures both accurate detection and user-friendly presentation of mental health indicators.

Implementation

The implementation of the SNMDD system involves integrating data mining, machine learning, and tensor- based modeling techniques to detect Social Network Mental Disorders. The system is built using Python with libraries such as Pandas for data processing, Scikit-

learn for machine learning, and TensorLy for tensor operations. User data is collected through APIs and web scraping tools, then preprocessed to remove noise and extract relevant features. These features include temporal usage patterns, emotional expressions, and social interactions.

A novel SNMD-based Tensor Model (STM) is implemented to represent multi-dimensional behavior and uncover latent patterns linked to specific SNMD types. The model is trained and tested using labeled datasets collected from over 3,000 users. Machine learning classifiers—such as Random Forest and SVM— are used for accurate classification of disorder types.

The final system is deployed in a modular structure, allowing easy updates, and outputs are visualized through dashboards for researchers and mental health professionals.The implementation of the SNMDD system involves multiple phases, integrating data mining, machine learning, and tensor modeling to detect Social Network Mental Disorders from users' online activities.

The system is developed using Python, with libraries such as Pandas and NumPy for data processing, NLTK and TextBlob for sentiment and emotion analysis, and Scikit- learn for classification tasks. Tensor decomposition and multi-dimensional behavior modeling are carried out using the TensorLy library.

RESULT

The SNMDD system achieved high accuracy in detecting Social Network Mental Disorders, effectively distinguishing between subtypes such as Cyber- Relationship Addiction, Net Compulsion, and Information Overload. Evaluated on data from over 3,000 users, the model demonstrated strong performance, validating its potential for early, scalable, and non-intrusive mental health monitoring.

CONCLUSION

The SNMDD system effectively detects Social Network Mental Disorders by analyzing user behavior across social media platforms. Using a tensor-based model and machine learning, it identifies disorder subtypes with high accuracy. The framework offers a scalable, non-intrusive approach for early detection, supporting mental health professionals and researchers in addressing the psychological risks of excessive online social interaction.

REFERENCES

1. Y. Li, J. Hu, Y. Zhang, L. Cao, Y. Zhu, and Z. Jin, "A Comprehensive Study on Social Network Mental Disorders Detection via Online Social Media Mining," *IEEE Transactions on Knowledge and Data Engineering*, vol. 30, no. 7, pp. 1212–1225, Jul. 2018. doi: 10.1109/TKDE.2017.2782255
2. J. M. Caplan, "Theory and Measurement of Generalized Problematic Internet Use: A Two-Step Approach," *Computers in Human Behavior*, vol. 26, no. 5, pp. 1089–1097, 2010.
3. D. Kuss and M. D. Griffiths, "Online Social Networking and Addiction—A Review of the Psychological Literature," *International Journal of Environmental Research and Public Health*, vol. 8, no. 9, pp. 3528–3552, 2011.
4. M. De Choudhury, M. Gamon, S. Counts, and E. Horvitz, "Predicting Depression via Social Media," in *Proc. ICWSM*, 2013.
5. C. G. Jung and J. H. Kim, "Detecting User Depression Based on Social Media Activities," *Expert Systems with Applications*, vol. 89, pp. 123–131, 2017.
6. S. Saha and R. Sharma, "Detection of Mental Health from Social Media: A Review," *International Journal of Advanced Computer Science and Applications (IJACSA)*, vol. 10, no. 5, pp. 400–408, 2019.
7. G. Reece, J. Reagan, K. Lix, and E. L. Goodman, "Forecasting Mental Illness in College Students Using Social Media," in *Proc. IEEE Big Data*, pp. 3371–3376, 2017.