

A Review on Depression and Stress monitoring System via Social Media Data using Deep learning Framework

Paresha Saraf¹, Mohini Biradar², Tejaswini Tupe³, Tejas Ghorpade⁴, Deepali Rane⁵, Mukta Patil⁶

Students, Department of Computer Engineering^{1,2,3,4}

Professor, Department of Computer Engineering^{5,6}

D. Y. Patil College of Engineering, Akurdi, Pune, India

Abstract: *Stress and depression are prevalent mental health conditions that significantly impact society. The use of automated health monitoring systems can be vital in improving the detection and management of depression and stress through social networking. Sentiment analysis involves natural language processing and text mining techniques that aim to identify emotions and opinions. Emotional computing is the development and study of devices and systems that can recognize, interpret, process, and mimic human emotions. By using sentiment analysis and deep learning techniques, effective algorithms and systems can be created to target the assessment and monitoring of mental health disorders, especially depression and stress. This paper discusses the application of sentiment analysis and deep learning methods in detecting and monitoring depression and stress. Additionally, the paper proposes a basic design for an integrated multimodal system for stress and depression monitoring that incorporates sentiment analysis and emotional processing techniques. Specifically, the paper outlines the key issues and challenges involved in developing such a system.*

Keywords: stress and depression; health; sentiment analysis, socialmedia, deep learning

REFERENCES

- [1] Renata L. Rosa, Gisele M. Schwartz, Wilson V. Ruggiero, and Dem'ostenes Z. Rodr'iguez, Senior Member, IEEE" A Knowledge- Based Recommendation System that includes Sentiment Analysis and Deep Learning" IEEE 2019.
- [2] Guang Yang, Haibo He, Fellow, IEEE, and Qian Chen" Emotion- Semantic Enhanced Neural Network" IEEE 2019.
- [3] M. Al-Qurishi, M. S. Hossain, M. Alrubaian, S. M. M. Rahman, and A. Alamri, "Leveraging analysis of user behavior to identify malicious activities in large-scale social networks," IEEE Transactions on Industrial Informatics, vol. 14, no. 2, pp. 799–813, Feb 2018.
- [4] H. Lin, J. Jia, J. Qiu, Y. Zhang, G. Shen, L. Xie, J. Tang, L. Feng, and T. S. Chua, "Detecting stress based on social interactions in social networks," IEEE Transactions on Knowledge and Data Engineering, vol. 29, no. 9, pp. 1820–1833, Sept 2017.
- [5] Budhaditya Saha, Thin Nguyen, Dinh Phung, Svetha Venkatesh" A Framework for Classifying Online Mental Health Related Communities with an Interest in Depression" IEEE 2016.
- [6] Chun-Hao Chang, Elvis Saravia, Yi-Shin Chen" Subconscious Crowdsourcing: A Feasible Data Collection Mechanism for Mental Disorder Detection on Social Media" 2016 IEEE/ACM
- [7] Andrey Bogomolov, Bruno Lepri, Michela Ferron, Fabio Pianesi, Alex (Sandy) Pentland," Daily Stress Recognition from Mobile Phone Data, Weather Conditions and Individual Traits" IEEE Conference 2015
- [8] Bimal Viswanath† Alan Mislove†‡ Meeyoung Cha† Krishna P. Gummadi," On the Evolution of User Interaction in Facebook" ACM 2011
- [9] I.-R. Glavan, A. Mirica, and B. Firtescu, "The use of social media for communication." Official Statistics at European Level. Romanian Statistical Review, vol. 4, pp. 37–48, Dec. 2016.

- [10] E. U. Berbano, H. N. V. Pengson, C. G. V. Razon, K. C. G. Tungcul, and S. V. Prado, "Classification of stress into emotional, mental, physical and no stress using electroencephalogram signal analysis," in 2017 IEEE International Conference on Signal and Image Processing Applications (ICSIPA), Sept 2017, pp. 11–14.
- [11] J. Ham, D. Cho, J. Oh, and B. Lee, "Discrimination of multiple stress levels in virtual reality environments using heart rate variability," in 2017 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), July 2017, pp. 3989–3992.
- [12] Y. Xue, Q. Li, L. Jin, L. Feng, D. A. Clifton, and G. D. Clifford, "Detecting adolescent psychological pressures from micro-blog," in Health Information Science. Springer International Publishing, 2014, pp. 83–94.
- [13] S. Tsugawa, Y. Kikuchi, F. Kishino, K. Nakajima, Y. Itoh, and H. Ohsaki, "Recognizing depression from twitter activity," in Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems, 2015, pp. 3187–3196.
- [14] M. De Choudhury, S. Counts, E. J. Horvitz, and A. Hoff, "Characterizing and predicting postpartum depression from shared facebook data," in Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work; Social Computing, 2014, pp. 626–638.
- [15] R. Rodrigues, R. das Dores, C. Camilo-Junior, and C. Rosa, "Sentihealth-cancer: A sentiment analysis tool to help detecting mood of patients in online social networks," International Journal of Medical Informatics, vol. 1, no. 85, pp. 80–95, 2016.
- [16] M. Khodayar, O. Kaynak, and M. E. Khodayar, "Rough deep neural architecture for short-term wind speed forecasting," IEEE Transactions on Industrial Informatics, vol. 13, no. 6, pp. 2770–2779, Dec 2017.
- [17] N. Majumder, S. Poria, A. Gelbukh, and E. Cambria, "Deep learning based document modeling for personality detection from text," IEEE Intelligent Systems, vol. 32, no. 2, pp. 74–79, Mar 2017.
- [18] R. G. Guimarães, R. L. Rosa, D. D. Gaetano, D. Z. Rodríguez, and G. Bressan, "Age groups classification in social network using deep learning," IEEE Access, vol. 5, pp. 10 805–10 816, 2017.
- [19] O. Araque, I. Corcuera-Platas, J. F. Sánchez-Rada, and C. A. Iglesias, "Enhancing deep learning sentiment analysis with ensemble techniques in social applications," Expert Systems with Applications, vol. 77, pp. 236 – 246, 2017.
- [20] Y. Chen, M. L.-J. Yann, H. Davoudi, J. Choi, A. An, and Z. Mei, "Contrast pattern based collaborative behavior recommendation for life improvement," Jun 2017, pp. 106–118.
- [21] H. Hu, A. Elkus, and L. Kerschberg, "A personal health recommender system incorporating personal health records, modular ontologies, and crowd-sourced data," in 2016 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), Aug 2016, pp. 1027–1033.
- [22] Sachinopoulou, J. Leppanen, H. Kaijanranta, and J. Lahtenmaki, "Ontology-based approach for managing personal health and wellness information," in 2007 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Aug 2007, pp. 1802–1805.
- [23] J. Tang, Y. Zhang, J. Sun, J. Rao, W. Yu, Y. Chen, and A. C. M. Fong, "Quantitative study of individual emotional states in social networks," IEEE Transactions on Affective Computing, vol. 3, no. 2, pp. 132–144, April 2012.