improving stress management in a sample of university students: A randomized controlled trial. Journal of Affective Disorders. 2021; 279: 684-692.

- 8. Pomytkin E.; Pomytkina L. Use of a virtual assistant in preparing elderly people to overcome loneliness. *Information Technologies and Learning Tools*. Vol. 90 No. 4/ 2022-09-29. https://doi.org/10.33407/itlt.v90i4.4923
- 9. Ramshore A., ELIZA: The Chatbot Who Revolutionised Human-Machine Interaction, 2021. https://medium.com/nerd-fortech/eliza-the-chatbot-who-revolutionised-human-machine-interaction-an-introduction-582a7581f91c
- 10. Rezaei-Adaryani F., et al. Efficacy of a Mobile Application for Stress Management in University Students: A Randomized Controlled Trial. *International Journal of Mental Health and Addiction*. 2021. Vol. 19(2). P. 472-483.
- 11. Sixtyclicks. Q&A with Martin Wikfalk, founder of The Mindfulness App. 2019.

https://www.sixtyclicks.com/2019/05/13/qa-with-martin-wikfalk/

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## PSYCHOLOGICAL BASIS OF THE CRIMINOGENIC TONE FORMATION OF THE TEXT AND ITS AUTOMATIC DETERMINATION

Information published in social networks plays an important role in modern society, which makes the issue of the psychological state of Internet users even more relevant. It determines success, features of interaction, emotional component and behavioral reactions of persons who encounter it. In social, clinical and legal psychology, topical issues of cyber socialization, features of the formation and manifestation of an individual or a social group in the conditions of the information society, the emergence of new phobias that encourage consideration of the impact of cyberspace on the psyche of its users are considered [1; 3; 8].

However, based on the latest events in our society, high-profile events, cataclysms, catastrophes, and military operations are increasingly occupying the information space. This information space cannot fail to influence the psychological phenomena of Internet users (processes, states, properties), and, accordingly, its manifestations in virtual and real space (communication, behavior, action). Due to the appearance in social networks of fear, tension, panic, despair, anxiety, regret, aggression, hatred, etc., the number of violent acts in cyberspace between acquaintances and strangers and conflicts in interpersonal interaction is increasing. These processes do not bypass both active Internet users, i.e. commentators, and persons who are simply in this information space, i.e. witnesses.

So, similar states, corresponding moods in social networks and the active social position of the modern user lead to criminogenic Internet communication, with the help of which deviant, extremist and other aggressive speech actions are implemented. In turn, such actions create threats to the informational and psychological security of Internet users. That is why new circumstances, such as social events and technological development (information war, dependence on social media, rapid modification of devices, new phobias), require additional research and development not only of psychological state indicators, but also of corresponding linguistic markers of emotional triggers, i.e. criminogenic tone that are present in online texts and communications.

According to the trends, the problem of controlling the criminogenic tone in Internet comments becomes especially important, that is, the need to ensure security in social networks. According to a Pew Research Center (2019) study, more than half of US adult social media users believe that their personal information in cyberspace is not adequately protected. Besides, one of the biggest threats to safety on the Internet with criminogenic attitudes is cyberbullying, that is, a type of online bullying that consists in the purposeful and systematic infliction of psychological, moral, material and even physical harm on other

Internet users (for example, leading to suicide) [5].

Thus, the criminogenic tone is the emotional mood of users on the Internet, which is realized through comments on articles, blogs and other materials, and contains elements of violence, threats, insults, discrimination, etc., which leads to harm to the psychological health of other users, a decrease in culture communication and even to criminal offenses. Identifying a criminogenic tone consists in classifying the text as positive, neutral, compound or negative, i.e. threatening moods [2; 6; 7]. Based on these studies, our research goal can be the development of a neural network that will be able to determine the level of criminogenicity of texts on a scale from non-criminogenic to highly criminogenic.

Today, there are two main methods of solving problems of automatic tonality determination. The first of which is a statistical method based on the use of collections (corpus) of texts marked in advance by tonality, on which the model is then trained to determine the tonality of the selected segment of the text. Instead, the second method is based on the compilation of special semantic thesauruses (tonal dictionaries) of positive and negative words and expressions. This method can use both lists of patterns and rules for combining tonal vocabulary within a sentence, based on grammatical and syntactic analysis. These dictionaries are necessary when compiling special computer programs, the purpose of which is to solve one or another task by the method of sentiment analysis [4].

Therefore, since the expression of emotions is an integral part of the reader's comment, the definition and differentiation of its tonality, especially of a threatening nature, becomes the basis for identifying and predicting the negative impact on the mental state of Internet users. In addition, the use of linguistic methods, artificial intelligence and machine learning to automatically detect and filter criminogenic content can help reduce the number of criminogenic comments and increase the level of security in Internet communications.

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## References

- 1. Hyland, P., Vallières, F., Shevlin, M., Karatzias, T., Ben-Ezra, M., McElroy, E., Martsenkovskyi, D. (2022, October 7). The psychological consequences of war in Ukraine: Assessing changes in mental health among Ukrainian parents. PsyArXiv, 24. https://doi.org/10.31234/osf.io/jp5vh
- 2. Liu, B. (2012). Sentiment analysis and opinion mining. Morgan & Claypool Publishers.
- 3. Nemesh, O. (2017). Virtual activity of the person: the structure and dynamics of psychological content: Monograph. Word, 391.
- 4. Pang, B., & Lee, L. (2008) Opinion Mining and Sentiment Analysis. Foundations and Trends in Information Retrieval, 2, 1-135. doi: 10.1561/1500000011
- 5. Pomytkina, L., Podkopaieva, Yu., & Hordiienko, K. (2021). Peculiarities of Manifestation of Student Youth' Roles and Positions in the Cyberbullying Process. International Journal of Modern Education and Computer Science (IJMECS), 13(6), 1-10. doi: 10.5815/ijmecs.2021.06.01
- 6. Shamantha, R.B., Shetty, S.M., & Rai, P. (2019). Sentiment Analysis Using Machine Learning Classifiers: Evaluation of Performance. IEEE 4th International Conference on Computer and Communication Systems (ICCCS). 21-25, doi: 10.1109/CCOMS.2019.8821650.
- 7. Singh, C., Imam, T., Wibowo, S., & Grandhi, S. (2022). A Deep Learning Approach for Sentiment Analysis of COVID-19 Reviews. Appl. Sci., 12(8), 3709, doi: 10.3390/app12083709.
- 8. Tokarev, N., Shamne, A., & Khalik, O. (2017). Variability of personality socialization in the modern information society: collective monograph. Interservice LLC, 220.