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Prediction of the Big Five Personality Traits of Students' Writing in Social Media: A Review

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ABSTRACT: This study evaluated the effectiveness of using three AI-based Natural Language Processing (NLP) tools to determine the Big Five personality traits of students based on their written text in social media learning environments. The findings showed a strong correlation between the AI predictions and the traditional questionnaire results, confirming that AI can accurately infer personality from student text. The research highlights that text quality is the most crucial factor for achieving high prediction accuracy.

KEYWORDS: Personality prediction, Online Social Media, big five, natural language processing, Machine Learning.

I. INTRODUCTION

Personality, defined as the combination of traits such as emotion and behavior, characterizes each individual and governs their interactions with others and their environment. Social media networks have become a platform where users demonstrate themselves, sharing ideas and engaging in social interaction, leading to the formation of an online persona that often represents their personality. This significance of personality presentation online has driven the development of automatic personality recognition systems on social media, which employ text analytics to infer social and psychological traits from user interactions like tweets and posts.

In the teaching and learning domain, understanding a learner's personality is highly valuable, as it allows educators to tailor their teaching methods to better suit the individual needs and preferences of each student. Academic research has consistently found a link between personality and academic achievement, concluding that traits like conscientiousness, openness to experiences, and emotional stability are positively related to academic success. Because all students utilize Online Social Networks (OSNs), these environments provide important data that can be leveraged to study students' personalities.

II. LITERATURE SURVEY

MurtuzaShahzad [1], This study aims to predict the emotional impact of Facebook posts relating to research articles. We collected data on Facebook posts related to various scientific research domains, including Health Sciences, Social Sciences, Dentistry, Arts, and Humanities. We observed Facebook users' reactions towards research articles and posts and found that 'Like' reactions were the most common.

Yash Mehta [2], This review paper provides an overview of the most popular approaches to automated personality detection, various computational datasets, its industrial applications, and state-of-the-art machine learning models for personality detection with specific focus on multimodal approaches. Personality detection is a very broad and diverse topic: this survey only focuses on computational approaches and leaves out psychological studies on personality detection.

MervatRagabBakry [3], Online social networks (OSNs) have become essential ways for users to socially share information and feelings, communicate, and thoughts with others through online social networks. Online social networks such as Twitter and Facebook are some of the most common OSNs among users. Users' behaviors on social networks aid researchers for detecting and understanding their online behaviors and personality traits.

Abhishek S. Rao [4], The use of MBTI categorization questionnaires was the only available system for career counselors which were a tedious task and may lead to manual errors. The availability of various career opportunities

due to the change in technological trends has made career guidance a challenging task for counselors. Hence, there is a need for automated technology that will try to learn the personality of a person and predict a suitable career goal in a sophisticated manner.

Hans Christian [5], this paper introduces a new prediction using multi model deep learning architecture combined with multiple pre-trained language model such as BERT, RoBERTa, and XLNet as features extraction method on social media data sources. Finally, the system takes the decision based on model averaging to make prediction.

KristianaNathaliaWea [6], This study aims to determine the FKIP students' perceptions on the use of Microsoft Teams application in online learning during the COVID-19 pandemic. The sample of this research was 176 FKIP students' which were spread in 5 study programs. They are Physics Education, Chemistry Education, Biology Education, and Elementary School Teacher Education.

Nisserine El Bahri [7], The purpose of this study is to ascertain whether or not students interact with classmates and other participants in learning platforms in a way that accurately represents their personalities. Data from a sample of students at AbdelmalekEssaadi University of Tetouan were collected from various social media learning environments for the experimental investigation presented in this work, and Symanto AI-based personality tool was used to assess the data.

Gerald Matthews et al[8] third edition of this comprehensive textbook delves into core human personality traits, examining their significance, origins, and impact on life, health, and cognition. Updated with the latest insights from behavioral genetics, neuroscience, social psychology, and cognitive science, the text explores how personality traits shape mental and physical health and influence stress responses. With new content on positive trait aspects and practical applications in clinical, educational, and occupational settings, this book is an essential resource for students of Personality and Individual Differences, as well as researchers and practitioners. Professors Gerald Matthews, Ian J. Deary, and Martha C. Whiteman bring a wealth of expertise, offering readers an in-depth, up-to-date survey of personality research.

Robin S.S. Kramera et al.[9] Many aspects of personality are honestly signaled on the human face, as shown by accurate identification of personality traits from static images of unknown faces with neutral expressions. Here, we examined the evolutionary history of this signal system. In four studies, we found that untrained human observers reliably discriminated characteristics related to extraversion solely from nonexpressive facial images of chimpanzees (*Pan troglodytes*). In chimpanzees, as in humans, there is therefore information in the static, nonexpressive face that signals aspects of an individual's personality. We suggest that this performance is best explained by shared personality structure and signaling in the two species.

Mirella Walker et al[10] This study explores how judgments of personality traits based on facial evaluations relate to dimensions of trustworthiness (intention) and dominance (ability to harm). Findings suggest that the Big Two personality traits map closely onto a 2D trustworthiness-dominance space, while Big Five traits like neuroticism, extraversion, and conscientiousness extend beyond it, implying additional dimensions are necessary for accurate personality judgments from faces. Validation studies reveal consistent differentiation of the Big Two and Big Five traits across faces and participants, suggesting that shared social perceptions of personality, regardless of accuracy, can shape subjective realities with potential consequences for those judged. This methodological approach offers valuable applications in psychology.

III. EXISTING SYSTEM

The foundational existing system for personality assessment is the well-established Big Five questionnaire, or the Five Factor Personality Model (FFM), which provided the ground truth for this study. The authors' preliminary research constituted the prior AI-based approach, but it suffered from two key limitations that this new study aimed to resolve. Specifically, the original study was based on a very small sample size of only 10 students, making its results insufficient for generalization. Furthermore, that initial work tested the effectiveness of only one AI-based personality analysis tool ("symanto"). Therefore, the existing system provided a proof-of-concept, but lacked the necessary scale and comparative analysis to fully assess the utility of AI in this context.

IV. PROPOSED SYSTEM

The proposed system involved a significant expansion of the authors' previous work, using a much larger sample of students to ensure the generalizability of results. Data was meticulously collected from student interactions across several social media-based learning environments, specifically WhatsApp, Facebook, and Microsoft Teams, to capture diverse textual data. Each student provided a minimum of 53 text samples, as meeting the required data quantity was considered crucial for predicting personality accurately. The collected and pre-processed text was then analyzed using three different AI-based personality recognition tools: Symanto, Apply Magic Sauce, and IBM Watson Personality Insights. Finally, the predictions from these three AI tools were evaluated by comparing them against the established results of the Big Five questionnaire administered to the same student group.

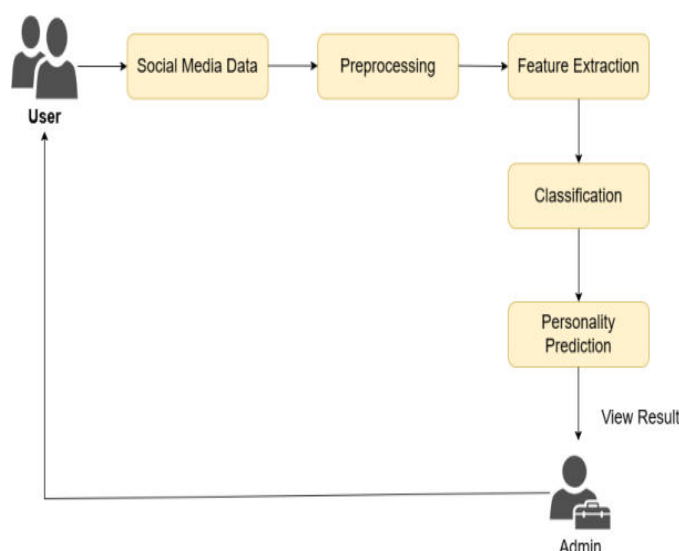


Figure 1. System Architecture

V. CONCLUSION

The study concluded that AI-based technology is a highly effective alternative for determining student personality from their written text in learning environments. The algorithms accurately predicted the majority of students' personality traits, including the dominant characteristic, with a low error value. The results showed a strong correlation of approximately 0.6 between the traits identified by the traditional Big Five questionnaire and those anticipated from the students' text data. Critically, all three tested AI-based tools proved to be extremely useful and their predictions were very close to one another, confirming their shared efficacy. The research also confirms that the single most crucial element for achieving good accuracy is ensuring the strong quality of the text data provided by the learner.

REFERENCES

- [1] H. Christian, D. Suhartono, A. Chowanda, and K. Z. Zamli, "Text based personality prediction from multiple social media data sources using pre trained language model and model averaging," J. Big Data, vol. 8, no. 1, pp. 1–20, Dec. 2021.
- [2] M. R. Bakry, "A survey of psychological personality classification approaches," Future Comput. Informat. J., vol. 4, no. 2, pp. 79–89, Sep. 2020.
- [3] El Bahri, Z. Itahriouan, A. Abtoy, and S. B. Belhaouari, "Using students' digital written text in Moroccan dialect for the detection of student personality factors," Int. J. Cogn. Res. Sci., Eng. Educ., vol. 11, no. 3, pp. 389–400, 2023.
- [4] M. Shahzad, C. Freeman, M. Rahimi, and H. Alhoori, "Predicting Facebook sentiments towards research," Natural Lang. Process. J., vol. 3, Jun. 2023, Art. no. 100010.
- [5] M. Napratilora, H. Lisa, and I. Bangsawan, "Using WhatsApp as learning media in teaching reading," MITRA PGMI, Jurnal Kependidikan MI, vol. 6, no. 2, pp. 116–125, Jul. 2020.

- [6] K. N. Wea and A. D. Kuki, “Students’ perceptions of using Microsoft teams application in online learning during the Covid-19 pandemic,” in Proc. J. Phys., Conf., Mar. 2021, Art. no. 012016.
- [7] Y. Mehta, N. Majumder, A. Gelbukh, and E. Cambria, “Recent trends in deeplearning based personality detection,” Artif. Intell. Rev., vol. 53, no. 4, pp. 2313–2339, Apr. 2020.
- [8] G. Matthews, I. Deary, and M. Whiteman, Personality Traits. Cambridge, U.K.: Cambridge Univ. Press, 2009.
- [9] R. S. S. Kramer, J. E. King, and R. Ward, “Identifying personality from the static, nonexpressive face in humans and chimpanzees: Evidence of a shared system for signaling personality,” Evol. Hum. Behav., vol. 32, no. 3, pp. 179–185, May 2011, doi: 10.1016/j.evolhumbehav.2010.10.005.
- [10] M. Walker and T. Vetter, “Changing the personality of a face: Perceived big two and big five personality factors modeled in real photographs,” J. Personality Social Psychol., vol. 110, no. 4, pp. 609–624, 2016.



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