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## AI Driven Text Analysis Techniques in Social Sciences: Advancements and Applications

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This study explores the application of AI-driven text analysis techniques in social sciences, focusing on sociology, linguistics-language teaching, and psychology. As digital textual data proliferates, AI powered tools offer unprecedented capabilities to process and analyze vast corpora, revolutionizing research methodologies. We examine some of the current Natural Language Processing (NLP) and Machine Learning (ML) techniques, their applications, and ethical considerations. The paper presents three case studies: a social science analysis of Twitter data of public attention toward politics with election results and opinion polls election (Jungherr et al., 2017), an automated essay scoring system for Turkish language (Firoozi et al., 2023), and a mental health study detecting suicide signs in social media posts (Coppersmith et al., 2018). These cases demonstrate AI's potential in understanding political discourse, enhancing language education, and aiding mental health diagnosis. Our findings from these case studies reveal that AI-driven text analysis can uncover hidden patterns in large-scale datasets, provide consistent feedback in educational contexts, and identify subtle linguistic markers of mental health conditions. These case studies highlight the transformative impact of AI on social science methodologies, enabling rapid processing of vast amounts of unstructured text data and uncovering insights that might be imperceptible through traditional manual analysis. However, ethical challenges concerning privacy, bias, and interpretation of AI generated insights persist. The study concludes that while AI driven text analysis significantly enhances social science research capabilities, a critical approach considering limitations and ethical implications is crucial. As AI evolves, its integration with social sciences promises profound insights into human behavior, language, and society, necessitating ongoing interdisciplinary collaboration and ethical scrutiny.

Keywords: AI driven text analysis, social sciences, natural language processing, machine learning, ethical considerations

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