Proactive Mental Health Detection Leveraging Social Media Signals: Trends, Techniques and Challenges

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Abstract

The rapid growth of social media platforms such as Twitter, Reddit, Facebook, Instagram, and Snapchat has created new opportunities to study users' mental well-being through their language, visual content, and online activity patterns. Depression, in particular, often remains undiagnosed by conventional screening methods and can have serious consequences if it is not identified in time. This paper reviews trends and techniques for the proactive detection of mental health problems from social media, from early lexicon-based methods to machine learning, deep learning, and transformer-based models that exploit textual, visual, behavioural, temporal, and network-based features. It discusses multimodal and multisource fusion, temporal and personalized modelling, and cross platform generalization, and it summarizes the reported performance of representative deep learning models. The review also examines key challenges, including data quality, class imbalance, multilingual and cultural variation, privacy, informed consent, fairness, and interpretability. Transformer-based and multimodal approaches generally perform best, but their ability to generalize across platforms and populations remains limited. Future work should therefore focus on reliable, transparent, and ethically deployed systems that are validated across platforms, languages, and communities, with human oversight.

Keywords

Social media, depression detection, mental health, machine learning, deep learning.