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Machine Learning Meets Mental Health: Dual Feature Engineering in Anxiety Prediction

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Collaboration with the Malaysia Mental Health Associations

Leveraging Social Media Slang for Sustainable Anxiety Prediction

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Innovative Research on Mental Health Prediction

Breaking new ground with innovative approach to mental health assessment, our "Leveraging Social Media Slang for Sustainable Anxiety Prediction Through Dual Feature Engineering" research project explores how informal language used on social platforms can be harnessed to improve anxiety prediction models.

These days, social media platforms are important when it comes to talking about mental health, especially anxiety. They give us a way to connect and share experiences using slang that make discussions feel more relatable. By looking at how people talk about anxiety online, we can spot trends and changes in how folks feel. Overall, social media

can understand anxiety better and build a community where everyone can feel supported.

By focusing on the role of slang in emotional expression, our work sheds light on how individuals communicate their feelings online. This cutting-edge research not only holds the potential to revolutionize mental health assessments but also promotes sustainable software practices.

Our framework introduces several novel aspects to anxiety prediction, including:

- **Slang Term Identification:** Using a specially designed Social Media Slang Usage and Extraction Questionnaire (SUEQ), researchers collected slang terms related to anxiety from participants screened with the Generalized Anxiety Disorder-7 (GAD-7) questionnaire.
- **Expert Validation:** A glossary of anxiety-related slang terms was created and validated by subject matter experts, ensuring the reliability of these terms within the context of mental health.
- **Advanced Machine Learning Model:** The research employs dual feature engineering, combining slang features with traditional anxiety indicators. Machine learning techniques such as Support Vector Machines (SVM) are optimized through hyperparameter tuning, achieving significant improvements in prediction accuracy.

A pilot study conducted in four secondary schools involved 514 participants who identified 172 slang terms in both English and Malay that are commonly used to express anxiety. The expert validation process yielded high inter-rater reliability (0.83) and content validity (≥ 0.75). Most notably, the Support Vector Machine (SVM) model achieved a remarkable accuracy of 95.83%, a significant leap over previous baseline models. Implications for Mental Health Interventions highlights the potential of using domain-specific slang, in combination with expert validation, to improve anxiety predictions. This framework, when integrated into real-time surveillance systems, could enable earlier interventions and contribute to reducing anxiety levels within communities, fostering better mental health and well-being.

Our work was recently recognized at the Universiti Malaya Three Minute Thesis (3MT) competition, where she secured 3rd place at the faculty level. The research has also gained attention through collaborations with the Malaysia Mental Health Associations, reinforcing its impact and future potential in mental health interventions.



Dr Hema's student won 3rd Place for UM Three Minute Thesis at the Faculty Level

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