PENERAPAN TF-IDF DALAM DETEKSI *CYBERBULLYING* DENGAN ALGORITMA *SUPPORT VECTOR MACHINE* (SVM)

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INTISARI

Latar Belakang: Perkembangan teknologi informasi mendorong peningkatan penggunaan media sosial di kalangan remaja, namun juga memicu kasus *cyberbullying* yang berdampak serius pada kesehatan mental. Deteksi manual dinilai kurang efektif karena volume data yang besar dan kompleksitas bahasa. Oleh karena itu, dibutuhkan pendekatan berbasis pemrosesan bahasa alami menggunakan TF-IDF dan *algoritma Support Vector Machine* (SVM) untuk mengidentifikasi ujaran *cyberbullying* secara cepat dan akurat.

Tujuan: Penelitian ini bertujuan untuk untuk mengembangkan model deteksi *cyberbullying* menggunakan metode TF-IDF dalam ekstraksi fitur teks terkait *cyberbullying* dan *Support Vector Machine* (SVM) sebagai algoritma klasifikasi

Metode Penelitian: Penelitian dimulai dengan analisis permasalahan dan pengumpulan dataset berupa komentar yang mengandung indikasi cyberbullying. Data diproses melalui tahapan pra-pemrosesan, ekstraksi fitur dengan TF-IDF, dan klasifikasi menggunakan *baseline* dan algoritma SVM, serta evaluasi akurasi berdasarkan metrik evaluasi dari *confusion matrix*.

Hasil: Hasil pengujian menunjukkan bahwa model klasifikasi berbasis TF-IDF dan SVM mampu mendeteksi *cyberbullying* dengan akurasi mencapai 84%, serta nilai AUC yang stabil pada seluruh label, mengindikasikan performa klasifikasi yang konsisten dan andal.

Kesimpulan: Penerapan metode TF-IDF sebagai representasi fitur teks yang dikombinasikan dengan algoritma SVM terbukti efektif dalam mendeteksi ujaran *cyberbullying* pada data media sosial, dengan hasil evaluasi yang cukup baik dan potensi pengembangan lebih lanjut di masa depan.

Kata-kunci: *Cyberbullying*, TF-IDF, *Support Vector Machine*, Klasifikasi Teks, *Natural Language Processing*.

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IMPLEMENTATION OF TF-IDF FOR CYBERBULLYING DETECTION USING SUPPORT VECTOR MACHINE (SVM) ALGORITHM

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ABSTRACT

***Background**: The development of information technology has driven increased social media use among adolescents, but has also triggered cases of cyberbullying, which have serious impacts on mental health. Manual detection is considered ineffective due to the large data volume and language complexity. Therefore, a natural language processing-based approach using TF-IDF and the Support Vector Machine (SVM) algorithm is needed to identify cyberbullying utterances quickly and accurately.*

***Objective**: This research aims to develop a cyberbullying detection model using the TF-IDF method for text feature extraction related to cyberbullying and Support Vector Machine (SVM) as the classification algorithm.*

***Method**: The study began with problem analysis and dataset collection in the form of comments containing indications of cyberbullying. The data was processed through preprocessing, feature extraction with TF-IDF, and classification using the baseline and SVM algorithms. Accuracy was evaluated based on evaluation metrics derived from the confusion matrix.*

***Result**: The experimental results showed that the TF-IDF and SVM–based classification model was able to detect cyberbullying with an accuracy of 84%, along with a stable AUC value across all labels, indicating consistent and reliable classification performance.*

***Conclusion**: The application of the TF-IDF method as a text feature representation combined with the SVM algorithm has proven effective in detecting cyberbullying statements in social media data, showing good evaluation results and further development potential in the future.*

***Keywords**: Cyberbullying, TF-IDF, Support Vector Machine, Text Classification, Natural Language Processing.*

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