

ABSTRAK

Plagiarisme akademik semakin sulit dideteksi karena tidak hanya dilakukan melalui penyalinan langsung, tetapi juga melalui parafrase yang mengubah struktur kalimat tanpa mengubah makna. Penelitian ini mengembangkan sistem deteksi plagiarisme tugas mahasiswa menggunakan Sentence Embedding berbasis Transformer dan Cosine Similarity. Dataset yang digunakan terdiri dari 600 pasangan teks berbahasa Indonesia yang dianotasi manual sebagai ground truth dengan label plagiat dan tidak plagiat. Tahapan penelitian meliputi pengumpulan data, preprocessing selektif, tokenisasi subword pada model Transformer, pembentukan vektor embedding, perhitungan cosine similarity, penentuan threshold, dan evaluasi performa menggunakan accuracy, precision, recall, serta F1-score. Penelitian membandingkan metode baseline TF-IDF dengan dua model Transformer, yaitu all-MiniLM-L6-v2 dan paraphrase-multilingual-MiniLM-L12-v2. Hasil pengujian menunjukkan bahwa model paraphrase-multilingual-MiniLM-L12-v2 memperoleh performa terbaik dengan akurasi 86,67%, precision 0,83, recall 0,95, dan F1-score 0,89, sedangkan all-MiniLM-L6-v2 memperoleh akurasi 74,67% dan TF-IDF memperoleh akurasi 62,00%. Nilai threshold 0,70 ditetapkan berdasarkan analisis perubahan precision, recall, dan F1-score sehingga keputusan plagiat tidak hanya didasarkan pada asumsi, tetapi pada hasil evaluasi kuantitatif. Dengan demikian, pendekatan Sentence Embedding berbasis Transformer terbukti lebih efektif dibandingkan metode leksikal dalam mendeteksi plagiarisme berbasis parafrase pada tugas mahasiswa Teknik Informatika.

Kata kunci: Plagiarisme, Sentence Embedding, Transformer, Cosine Similarity, TF-IDF, Threshold. Academic plagiarism has become increasingly difficult to detect because it is not limited to direct copying but also includes paraphrasing that changes sentence structure while preserving meaning. This study develops a student assignment plagiarism detection system using Transformer-based Sentence Embedding and Cosine Similarity. The dataset consists of 600 Indonesian text pairs manually annotated as ground truth with plagiarism and non-plagiarism labels. The research stages include data collection, selective preprocessing, subword tokenization using Transformer models, embedding generation, cosine similarity calculation, threshold determination, and performance evaluation using accuracy, precision, recall, and F1-score. This study compares the TF-IDF baseline with two Transformer models, namely all-MiniLM-L6-v2 and paraphrase-multilingual-MiniLM-L12-v2. The results show that paraphrase-multilingual-MiniLM-L12-v2 achieves the best performance with 86.67% accuracy, 0.83 precision, 0.95 recall, and 0.89 F1-score, while all-MiniLM-L6-v2 achieves 74.67% accuracy and TF-IDF achieves 62.00% accuracy. The threshold value of 0.70 is determined based on the analysis of precision, recall, and F1-score changes, ensuring that the plagiarism decision is based on quantitative evaluation rather than assumption. Therefore, Transformer-based Sentence Embedding is more effective than lexical methods in detecting paraphrase-based plagiarism in Informatics student assignments. Keywords: Plagiarism, Sentence Embedding, Transformer, Cosine Similarity, TF-IDF, Threshold.