

BAB V

KESIMPULAN

Studi ini menunjukkan bahwa ketidakseimbangan kelas dalam data kelulusan mahasiswa memiliki dampak signifikan terhadap kinerja algoritma klasifikasi pembelajaran mesin. Tanpa penerapan teknik penyeimbangan seperti SMOTE, algoritma cenderung bias terhadap kelas mayoritas dan gagal mendeteksi mahasiswa yang berisiko tidak lulus tepat waktu. Dengan menerapkan SMOTE, semua algoritma yang dievaluasi, yaitu Decision Tree, Gaussian Naive Bayes, K-Nearest Neighbors, dan Support Vector Machine, menunjukkan peningkatan kinerja yang substansial, mencapai tingkat akurasi sekitar 99%. Diantara keempat model, SVM menunjukkan kinerja paling stabil baik sebelum maupun sesudah penyeimbangan data. Hasil ini menegaskan bahwa strategi praproses yang tepat, terutama dalam mengatasi ketidakseimbangan data, memainkan peran penting dalam mengembangkan sistem prediksi kelulusan yang akurat, adil, dan reliabel. Temuan studi ini dapat menjadi dasar bagi pembuatan kebijakan akademik yang bertujuan untuk meningkatkan tingkat kelulusan tepat waktu di perguruan tinggi. Untuk penelitian selanjutnya, disarankan untuk mengeksplorasi penyetelan hiperparameter guna mengoptimalkan kinerja model lebih lanjut, dan menerapkan metode ensemble seperti mengantongi, meningkatkan, atau menumpuk guna meningkatkan ketahanan dan generalisasi hasil klasifikasi di berbagai kumpulan data.

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