

## ABSTRAK

Perubahan metode pembelajaran dari sistem kelas ke *online* membawa perubahan yang sangat signifikan. Mahasiswa dituntut mampu beradaptasi pada perubahan pola belajar mengajar. Penelitian ini bertujuan untuk melakukan klasifikasi kemampuan adaptasi mahasiswa baru dalam pembelajaran *online* di Universitas Sanata Dharma dengan pendekatan *machine learning* menggunakan algoritma *stacking ensemble*. Metode penelitian menggunakan penggabungan *single classifier* dengan teknik *ensemble stacking* atau *stacked generalization* menggunakan *Random Forest*, *Decision Tree*, *K-Nearest Neighbor*, *Support Vector Machine*, dan *Neural Network* sebagai *base learner* dan *Logistic Regression* sebagai *meta learner*. Dari penelitian yang dilakukan, didapatkan *f-1 score* pada *Random Forest* sebesar 89.26%, *Decision Tree* 88.58%, *K-NN* 84.25%, *SVM* 88.98%, *Neural Network* 89.06%, *Logistic Regression* 89.07%, dan *Stacking* 88.86%. Meski dibandingkan dengan *single classifier* seperti *Decision Tree* dan *K-NN*, akurasi pada *Stacking* meningkat, akan tetapi tidak lebih optimal dari *Random Forest*, *SVM*, *Neural Network*, maupun *Logistic Regression*. Validasi keakuratan model menggunakan *Cross Validation* menghasilkan *f-1 score* berada pada angka 88% untuk setiap *n\_fold* yang menunjukkan bahwa *model stacking* yang diimplementasikan sudah baik dan stabil. Hal tersebut juga ditunjukkan pada hasil pengujian stabilitas algoritma *stacking* menggunakan data *random* yang berjumlah 10 dan 5 *record* dengan masing-masing sebanyak 5 kali percobaan dan hasil yang didapatkan *f-1 score* konsisten berada pada angka 88%.

**Kata Kunci:** Pembelajaran *Online*, Adaptasi Mahasiswa Baru, *Machine Learning*, *Ensemble*, *Stacking*.

## ABSTRACT

The change in learning methods from the classroom system to online brought very significant changes. Students are required to be able to adapt to teaching and learning patterns. This study aims to classify the adaptability of new students in online learning at Sanata Dharma University with a machine-learning approach using the stacking ensemble algorithm. The research method uses a combination of a single classifier with ensemble stacking or stacked generalization techniques using Random Forests, Decision Trees, K-Nearest Neighbors, Support Vector Machines, and Neural Networks as base learners and Logistic Regression as meta learners. From the research conducted, the f-1 score was obtained for Random Forest at 89.26%, Decision Tree at 88.58%, K-NN at 84.25%, SVM at 88.98%, Neural Network at 89.06%, Logistic Regression at 89.07%, and Stacking at 88.86%. Although compared to a single classifier such as a decision tree or a KNN, the accuracy of stacking increases, but it is not more optimal than a random forest, a SVM, a neural network, or a logistic regression. Validation of model accuracy using cross validation resulted in an F-1 score of 88% for each n-fold, which indicates that the implemented stacking model is good and stable. This is also shown in the results of testing the stability of the stacking algorithm using random data, which totals 10 and 5 records with 5 trials each, and the results obtained consistently show an F-1 score of 88%.

**Keywords:** Online Learning, Adaptability of New Students, Machine Learning, Ensemble, Stacking.