ABSTRACT

OPTIMIZATION OF NAIVE BAYES CLASSIFIER ALGORITHM USING PARTICLE SWARM OPTIMIZATION (CASE STUDY DATA: EARTHQUAKE DISASTER IN INDONESIA)

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The classification model that uses the Bayes method utilizes training and testing datasets with a ratio of 80:20 to calculate the probability of each class based on the feature values in it. This method is effective and fast for processing large amounts of data, but there are weaknesses in the Naïve Bayes Classifier (NBC) algorithm where the assumption of independence between attributes makes the accuracy value decrease. Attribute weighting can be done to overcome the presumption of independence. Optimization algorithms such as Particle Swarm Optimization (PSO) can be used for attribute weighting, overcoming the free assumptions of the NBC algorithm so that it can help improve the accuracy of the classification results. Parameter setting by PSO is considered adequate to improve the accuracy of the classification model. The design of the classification model utilizes earthquake disaster data in Indonesia as a dataset to classify earthquake strength based on its magnitude. The shocks generated by earthquakes are not only influenced by the magnitude but also by the depth at which the earthquake occurs. The classification process refers to the Earthquake Intensity Scale - Meteorology, Climatology and Geophysics Agency (SIG-BMKG) which is more straightforward and in accordance with environmental conditions in Indonesia, The aim is to facilitate the dissemination of information as an effort to mitigate natural disasters, especially earthquake disasters in Indonesia. The data goes through the stages of preprocessing, split data, and evaluation using the confusion matrix. In its implementation, trials were carried out by testing the number of particles and the combination of PSO parameters. The number of particles tested was 50 particles. Then in the parameter combination test, parameter C1 is 0.7 and C2 is 0.5. The results showed that the classification model with the NBC algorithm optimized with PSO was able to obtain an accuracy of 96%.

Keywords: Classification, Optimization, Naïve Bayes Classifier, Particle Swarm Optimization, SIG-BMKG.