

ABSTRACT

This study focuses on improving the accuracy of panic attack prediction using machine learning approaches, specifically Decision Tree and Random Forest models. One of the main challenges in panic attack prediction is data imbalance, where the amount of data from the majority class is much greater than the minority class. To overcome this, this study applies the Synthetic Minority Over-sampling Technique (SMOTE) as a data balancing method.

The dataset used was obtained from a mental health platform containing data on symptoms, conditions, and user habits. The data pre-processing process was carried out to clean and prepare the data before being fed into the model. The results showed that the application of SMOTE significantly improved model performance, especially in accuracy, precision, recall, and F1-score for the minority class. Random Forest with SMOTE gave the most optimal results compared to other approaches.

This study shows that handling data imbalance is very important in producing more reliable predictions, especially in the context of sensitive mental health. The results obtained are expected to be the basis for the development of a more accurate and adaptive early detection system for panic attacks.

Keywords: *Panic Attack Prediction, Machine Learning, Data Imbalance, SMOTE, Random Forest*