

Title: A Study of Machine Learning Techniques for Predictive Analysis of Suicidal Tendency Across Different Age Groups

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Abstract: Suicide is a serious public health concern, and life-saving early identification and prevention are essential. When it comes to forecasting suicide, risk based on a variety of criteria and signs, machine learning algorithms have shown encouraging results in recent years. This study uses machine learning techniques to predict suicide tendencies in various age groups. The first step in the research is to collect pertinent datasets including sociodemographic, clinical, behavioral, and psychiatric data on people who have attempted or succeeded in suicide. Preprocessing is done on these datasets to guarantee data quality, handle missing values, and normalize characteristics. Using evaluation measures such as accuracy, precision, recall, and F1-score, the best performing models are chosen to serve as the best suicide prediction classifiers. The findings show that suicide risk may be accurately, sensitively, and specifically predicted using machine learning techniques. With the help of the found predictive traits, at-risk people may get personalized treatments and support networks, as well as insights into the risk factors linked to suicide conduct. This study uses five different algorithms, wherein the support vector machine (SVM) emerges as the technique that performs the best, offering an accuracy of 0.89. The decision tree classifier comes as a close second, delivering the same accuracy. Following that, random forest obtains an accuracy of 0.84, KNN comes in second with 0.81, and gaussian naive bayes comes in third with 0.53.

Keywords: Suicide prediction Machine learning Suicide risk assessment Predictive analytics Support Vector Machine (SVM)

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