SRI VENKATESWARA COLLEGE OF ENGINEERING
(Autonomous)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Predicting Substance Consumption Patterns Using Behavioral Analytics and Demogaphic Details

Course: B.Tech **Year:** IV **Semester:** I **Section:** A

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ABSTRACT

Substance use is a major public health issue that carries serious individual and social consequences. Early detection and accurate classification of drug consumption are essential for ensuring effective interventions and the efficient allocation of resources. This project proposes an intelligent machine learning framework to predict an individual's likelihood of drug consumption by analyzing behavioral, demographic, and lifestyle data, including age, education, personality traits, and observable habits. Behavioral and demographic features are analyzed to classify individuals as drug users or non-users. Two high-performance classifiers, **Random Forest** and **XGBoost**, are employed to capture complex patterns in the data. Experimental results demonstrate that the enhanced framework, using Random Forest and XGBoost classifiers, significantly improves the accuracy of substance use classification, highlighting the effectiveness of these ensemble learning models for reliable prediction. The project classifies drug users, helping healthcare professionals and policymakers identify high-risk individuals and implement targeted, data-driven interventions for substance use prevention.

Keywords: Drug consumption prediction, Machine Learning, Random Forest, XGBoost, Behavioral analytics, Demographic data, Classification, Early detection, Public health intervention.

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