

# Student Mental Health Detection using Machine Learning

Swapnil Shivasharan, Suyash Shinde, Tanmay Sharma, Arya Chavan, Prof. R. A. Patil

Department of Information Technology

Smt. Kashibai Navale College of Engineering, Vadgaon, Pune, India

**Abstract:** *Mental health has become a critical concern globally, especially among students, who face various pressures such as academic performance, peer relationships, and future career prospects. The increasing prevalence of mental health challenges among this demographic underscores the urgent need for proactive detection and intervention methods. Conventional approaches to identifying mental health issues are often limited by delayed reporting, stigma, and lack of awareness, leading to insufficient or late interventions. This project explores the application of machine learning to address these challenges by developing a system for early detection of mental health conditions among students. The proposed approach utilizes a datasets comprising behavioral, academic, and demographic features. After preprocessing and feature engineering, machine learning algorithms such as Logistic Regression, Support Vector Machines (SVM), and Random Forest are applied to classify students based on their mental health risk levels. The models are evaluated using performance metrics, including accuracy, precision, recall, and F1-score, to determine their reliability and effectiveness. Cross-validation techniques ensure the robustness of the developed system, while hyperparameter tuning optimizes model performance. This project contributes to the broader field of mental health technology by showcasing the intersection of data science and psychology. By leveraging predictive analytic , it provides a scalable, data-driven solution to a pressing issue, paving the way for smarter and more efficient mental health management strategies in educational institutions.*

**Keywords:** Sports Management, Face Recognition, Event Automation, Internet of Things (IoT), Data Analytics