**Title of the Project : MACHINE-LEARNING-BASED-SAFETY-SYSTEM-FOR- WOMEN-WITH REALTIME-ALERTS-AND-GEO-TRACKING**

**Name of the Students : Aparna P**

**Archana A S**

**Register Number(s) : 2023PECCS1227**

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**ABSTRACT**

**Women’s safety remains a pressing concern in today’s rapidly urbanizing world, where unpredictable environments and delayed responses can lead to critical consequences. Traditional safety systems often rely on manual triggers or fixed thresholds, which may fail to detect nuanced or evolving threats. To address this gap, the present project introduces a machine learning-based safety system designed to intelligently classify human activity using sensor data and initiate real-time alerts in potentially dangerous situations. The system leverages the UCI Human Activity Recognition (HAR) dataset, which contains accelerometer and gyroscope readings from smartphones worn by individuals performing various physical activities. These sensor patterns are used to train and validate multiple machine learning models capable of distinguishing between normal and risky behaviors. Specifically, three classifiers—Random Forest, Support Vector Machine (SVM), and K-Nearest Neighbors (KNN)—were implemented to evaluate their effectiveness in activity recognition. A Voting Ensemble model was constructed to enhance predictive reliability. In addition to classification, the system integrates geo-tracking and automated messaging features to simulate emergency response protocols. When a high-risk activity is detected, the system transmits the user’s location and alert message to predefined contacts. Performance evaluation was conducted using accuracy, precision, recall, F1-score, and confusion matrices. The ensemble model demonstrated superior performance across all metrics, indicating its suitability for real-world deployment.**