School of Engineering and Applied Science (SEAS), Ahmedabad University

B.Tech (CSE Semester VI)
Machine Learning (CSE 523)
Project Abstract Submission 1

- **Group No.:** S_ECC4

- **Project Area:** Climate and Environment

- **Project Title:** Landslide Susceptibility Assessment by Novel Hybrid Machine Learning Algorithms

- **Name of the group members :**

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Abstract

Landslide is a natural phenomena, triggered by topographical, hydrological reasons [1], natural events such as heavy rainfall and earthquakes as well as anthropogenic activities like construction and mining also trigger landslides [2]. Thus landslides have vast effects on environmental conditions and economics of impact area [3]. Landslides cannot be controlled or stopped, but the losses caused by it can be reduced by establishing a system which can predict landslides or area highly prone to landslides for better management.

Machine Learning has effectiveness in representing an intricate connection between different natural indicators and different responses such floods [4, 5], wild fire [6], landslides [7–11] and so forth. Different Landslides Conditioning Factors(LCF) were utilized to set up a susceptible landslide prediction, for example, distance from roads, distance from rivers, inclination, curvature, vegetation, measure of precipitation, type of soil and so forth [12]. Hybrid models, for example, Bagging, Random Space, and Rotation Forest [14] with Alternating Decision Tree [13] as base classifiers were utilized for spatial prediction of landslides. The significant variables were determined by chi-square attribute evaluation technique. Data-driven quantitative methods are broadly used because gathering field information from landslides zones are difficult to get. [3].

Regression models target prediction by finding out the relationship between landslide susceptibility of a region and various landslide conditioning factors by plotting a plane which, with least errors, best fits our scatter. In the process of landslide susceptibility modelling, Alternating Decision Trees is a classification technique which will be used to split data into subsets. With each iteration, we will be estimating impact of different landslide conditioning factors on the prediction. In ADTree, using the Adaboost algorithm(for dimensionality reduction), it can easily learn alternating trees from the training dataset.

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