TECHNO HACKATHON

Team Name: Binary Bandits

Problem Statement Title: Comprehensive Crack Detection and Severity Classification in Concrete Structures

ABSTRACT

Crack identification and classification in concrete structures are critical for guaranteeing the structural integrity and safety of buildings, bridges, and roadways. Traditional techniques of crack identification, on the other hand, are frequently time-consuming, subjective, and need specialized staff, making them unsuitable for large-scale examinations. This paper provides an advanced deep learning strategy to reliably detect and characterize the kind of fracture in concrete buildings using photographs in answer to this problem.

For data preparation, the study employs the Keras deep learning toolkit, Convolutional Neural Network (CNN) architecture, and ImageDataGenerator. The Adam optimizer is used to train the model, and several performance measures are used to evaluate its performance. The findings show that the proposed deep learning methodology surpasses previous approaches in terms of accuracy and speed, and that it has the potential to drastically decrease the time and expense involved with fracture identification in concrete structures.

This study demonstrates the use of machine learning approaches in tackling actual difficulties in civil engineering and lays the groundwork for future research in this field. The suggested deep learning technique can aid in the speedy and efficient examination of concrete buildings, assuring their safety and integrity. The findings of this study may be utilized by civil engineers, building businesses, and governments to improve the quality of concrete structures and minimize the likelihood of structural failure-related incidents.