PROJECT PROPOSAL
EVALUATING ASTEROID CHARACTERISTICS AND CLASSIFYING ASTEROID THREAT ON PLANET EARTH

PROJECT DESCRIPTION

The threat of potentially hazardous asteroids to Earth has gained significant attention in recent years. To effectively mitigate the risk associated with these celestial bodies, accurate classification and early warning systems are essential. Our research project centers on NASA's Asteroid Classification dataset, a comprehensive repository of information on Near-Earth objects (NEOs). This project aims to analyze this dataset to gain insights into the properties and classifications of asteroids, particularly those categorized as potentially hazardous or non-hazardous. Our primary objectives include understanding the physical and orbital characteristics of NEOs, identifying the most critical variables impacting asteroid classification.

SMART QUESTIONS

1. In what ways can approaches such as oversampling, under sampling, and synthetic minority oversampling techniques contribute to addressing class imbalance in a dataset, thereby enhancing overall model performance?
2. Which classification models are capable of effectively distinguishing between hazardous and non-hazardous asteroids?
3. What will be the variables, such as Estimated Diameter, Orbital Characteristics, Relative Velocity, Diameter, that exert the most significant influence on the accuracy of models ?

OBJECTIVE

Given the historical data of all asteroids and their potential threat to earth, we aim to categorize the threat level of each asteroid based on classification criteria.

GITHUB

DATASET RESOURCE

Our dataset is available as Nasa Asteroids Classification at Kaggle. All the data is from the (http://neo.jpl.nasa.gov/). This API is maintained by Space Rocks Team: David Greenfield, Arezu Sarvestani, Jason English, and Peter Baunach. The dataset consists of 4687 data instances(rows) and 40 features(columns).

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