CI PROJECT

IDENTIFYING POTENTIALLY HAZARDOUS ASTEROIDS

TEAM MEMBERS

SURYANSH AMBEKAR (202201090042)
MAYANK SONI (202201090031)
AAYUSH TANK (202201070139)
SNEHA KURHADE (202201070137)

GUIDED BY:

DR. SMITA KULKARNI

MRS. ASWATHY M. A.

DR. NUTAN BANSODE

MOTIVATION

SPACE SAFETY

Early detection ensures planetary defense.

TECH OPPORTUNITY

Machine learning for asteroid classification.

ASTRONOMICAL SOLUTIONS

Real-time asteroid monitoring systems.

GLOBAL IMPACT

Enhance international space safety preparedness.

INNOVATION

Advance technology for planetary defense strategy.

AIM OF THE PROJECT

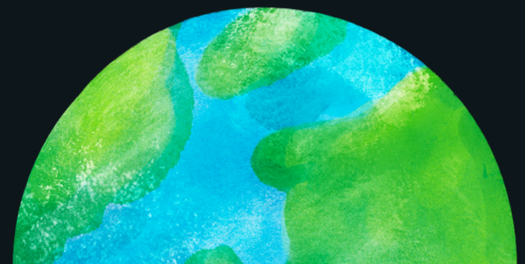
1. **To develop a machine learning model that classifies asteroids as hazardous or non-hazardous based on features like size, speed, and trajectory.**
2. Integrate MLOps for seamless real-time deployment and monitoring.
3. Enhance space safety.

DATASET AND METHODOLOGY

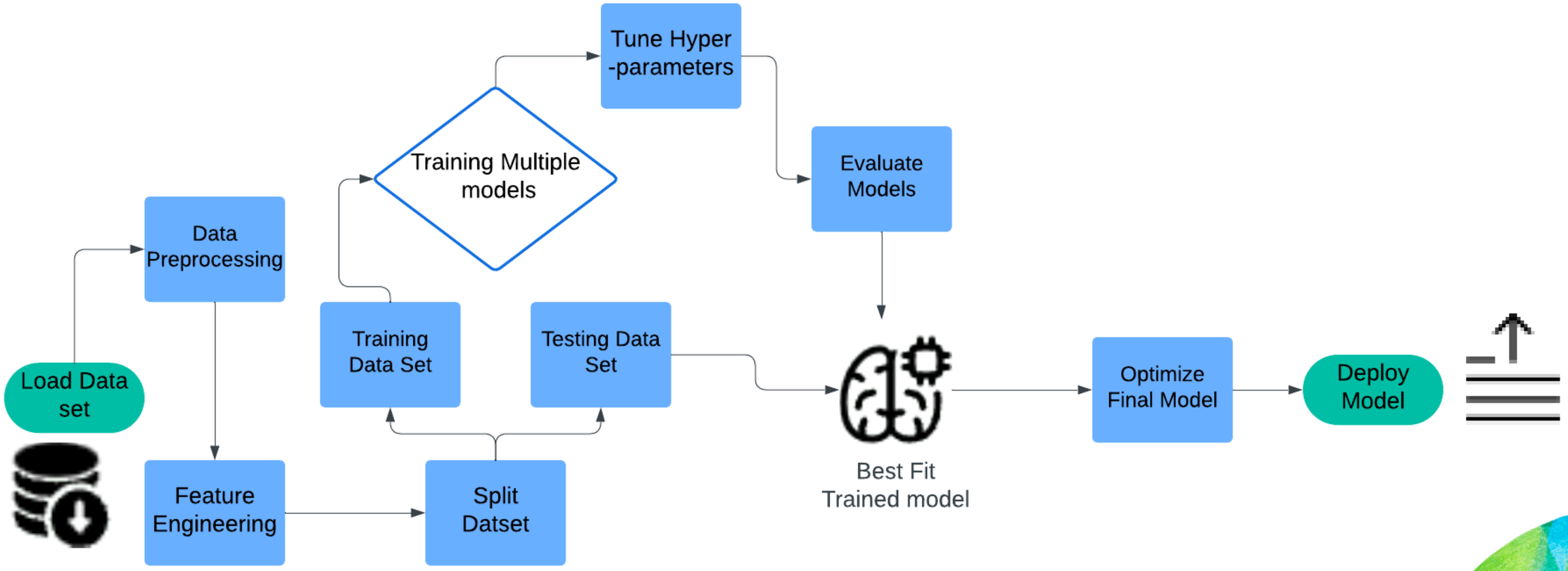
1. Data preprocessing and feature selection.
2. Multiple Model training on same dataset.
3. Finalising the most appropriate model.
4. Integration of ML Ops for deployment.

OUTCOME:
A user friendly GUI to interact with ML model.

DATA FROM NASA'S NEOWS (NEAR EARTH OBJECT WEB SERVICE)



FLOWCHART


Tune Hyper
-parameters
Training Multiple
models
Evaluate
Models
Data
Preprocessing
Training
Data Set
Testing Data
Set
Load Data
set
Feature
Engineering
Split
Datset
Best Fit
Trained model
Optimize
Final Model
Deploy
Model

RESULTS

Model	Accuracy (%)	Precision (%)	Recall (%)	F1 Score (%)
Decision Tree	99.57	99.11	98.23	98.67
Random Forest	99.43	99.55	96.9	98.21
Logistic Regression	96.23	91	84.96	87.87
SVM	95.81	90.73	82.3	86.31
KNN	89.69	71.89	58.85	64.72

CI/CD PIPELINES

CI Pipeline:

- Code commit → Automated testing → Model training → Validation → Versioning
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CD Pipeline:

- Fetch trained models → Build API → Deploy to production → Monitor performance

CHALLENGES AND POSSIBILITIES

- The project successfully classified asteroids with high accuracy and identified critical hazard factors.
- Real-time monitoring enhanced space safety measures.
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Future Work:

- Incorporating additional datasets for improved prediction.
- Refining the model for better scalability.

SCIENCE PROJECT BY OLIVIA WILSON

CONCLUDING REMARKS AND QUESTIONS

In this final slide, we will summarize our exploration of outer space and encourage further curiosity and discovery.

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