

ZYPHERX

Team Members

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PRESENTED BY :
ZYPHER

A CUSTOM AI PLATFORM
REVOLUTIONIZING EXOPLANET
DISCOVERY WITH MORE THAN

90% ACCURACY.

PROBLEM

1.

ASTRONOMERS SIFT THROUGH MILLIONS OF LIGHT CURVES — MOST ARE **FALSE POSITIVES**.

2.

MANUAL VERIFICATION TAKES MONTHS AND HUMAN BIAS **SLOWS DISCOVERY**.

3.

AS NEW TELESCOPE **DATA GROWS EXPONENTIALLY**, AUTOMATION IS ESSENTIAL.

4.

EXISTING METHODS ARE **SLOW**, LIMITED IN **ACCURACY**

OUR SOLUTION

AI/ML MODEL
SPECIFICALLY FOR
EXOPLANET DETECTION

90% accuracy, outperforming existing
research models

Processing time: **< 2s** per star

Scalable to Kepler, TESS

INTEGRATED PLATFORM FOR
RESEARCH, VISUALIZATION,
AND EXPLORATION OF
EXOPLANETS

Flow diagram:

Input (Light curve data) → AI Model →
Exoplanet Prediction (Probability %)

NEW AND FOLLOW UP PATHWAYS
ON EXOPLANETS

Multiple planet systems

Stellar type clustering

Energy budget mapping

Outlier detection

Correlation network



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Single Detection **SINGLE ROW ANALYSIS**

Input planetary parameters to detect potential exoplanets

TRANSIT DURATION (HOURS)	RIGHT ASCENSION (DEGREES)	STELLAR RADIUS (SOLAR RADII)
356	150.5	1.0
INSOLATION FLUX (EARTH FLUX)	DECLINATION (DEGREES)	PLANET RADIUS (EARTH RADII)
1.0	345	1.0
STELLAR TEMPERATURE (K)	KOI MODEL SNR	TRANSIT DEPTH (%)
5778	25.5	0.01
ORBITAL PERIOD (DAYS)	EQUILIBRIUM TEMPERATURE (K)	PLANET RADIUS MISSING
365.25	288	false

Detect Exoplanet

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Batch Analysis **DATASET ANALYSIS**

Analyze multiple exoplanets at once by uploading a CSV file with planetary parameters

label_1_data.csv
CSV files only

Multiple Planet Systems
Analyze star systems with multiple planets using RA, DEC, and orbital periods

Stellar Type Clustering
Group planets by star types using temperature and radius data

Energy Budget Mapping
Analyze planetary energy environments using flux, temperature, and size

Survey Completeness
Map regions with missing data to guide future observations

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BEGINNER'S GUIDE

What are exoplanets?

- Exoplanets are planets that orbit stars outside our Solar System.
- They can be rocky, gaseous, icy, or even ocean-covered.
- Scientists study them to understand how planets form and whether other worlds might be suitable for life.
- These discoveries show that our galaxy is full of diverse and fascinating planets.

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CHATBOT

How are exoplanets discovered?

AI Assistant

Hello! I'm Zyper, your AI research assistant. How can I help you today?
6:51:43 PM

Type your message...

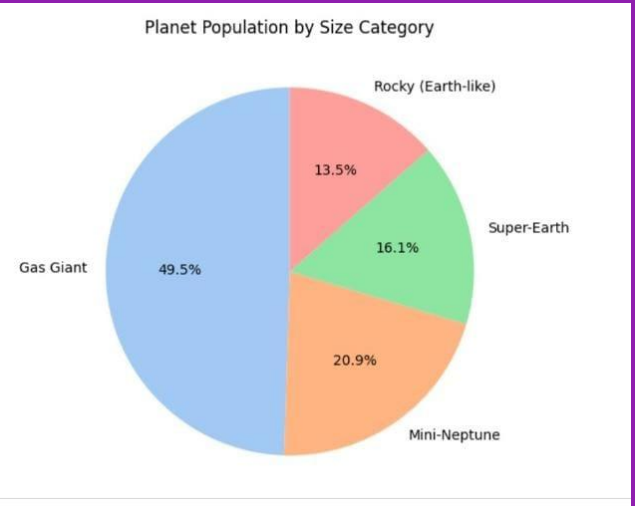
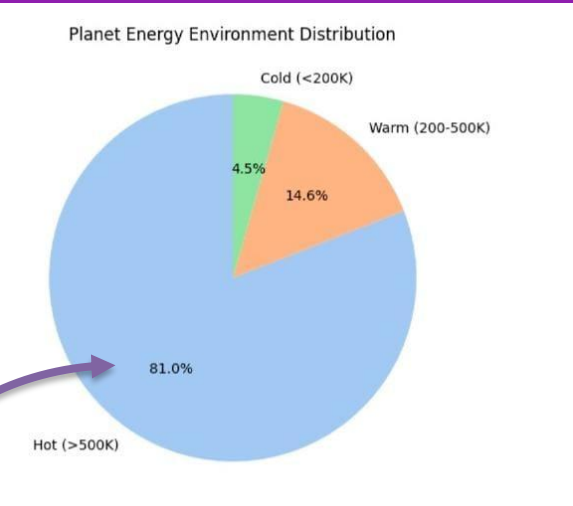
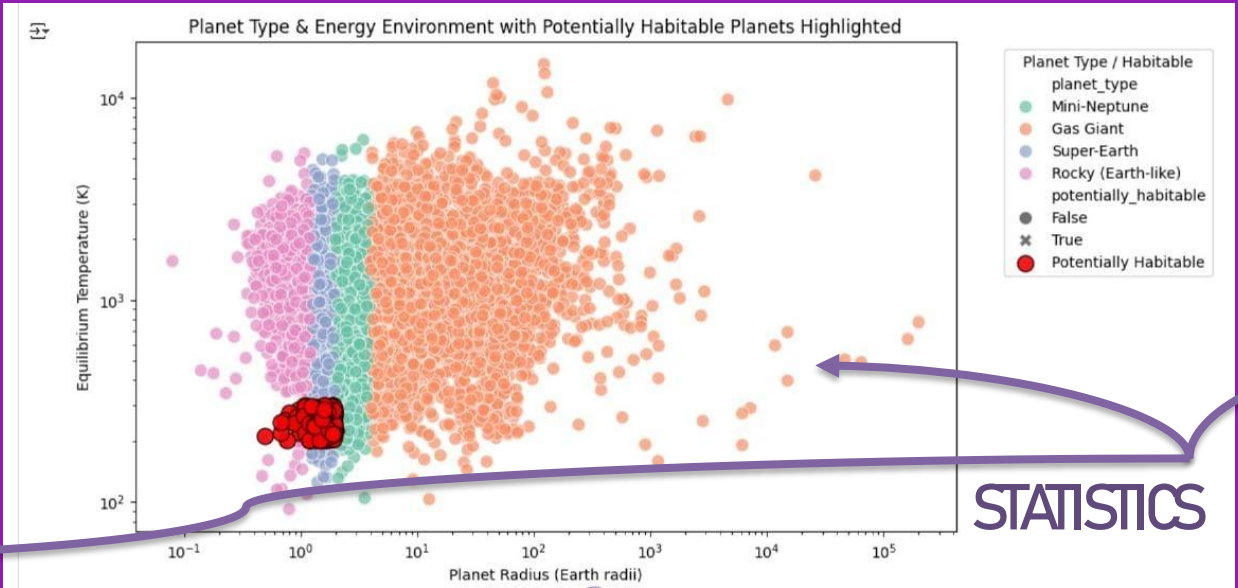
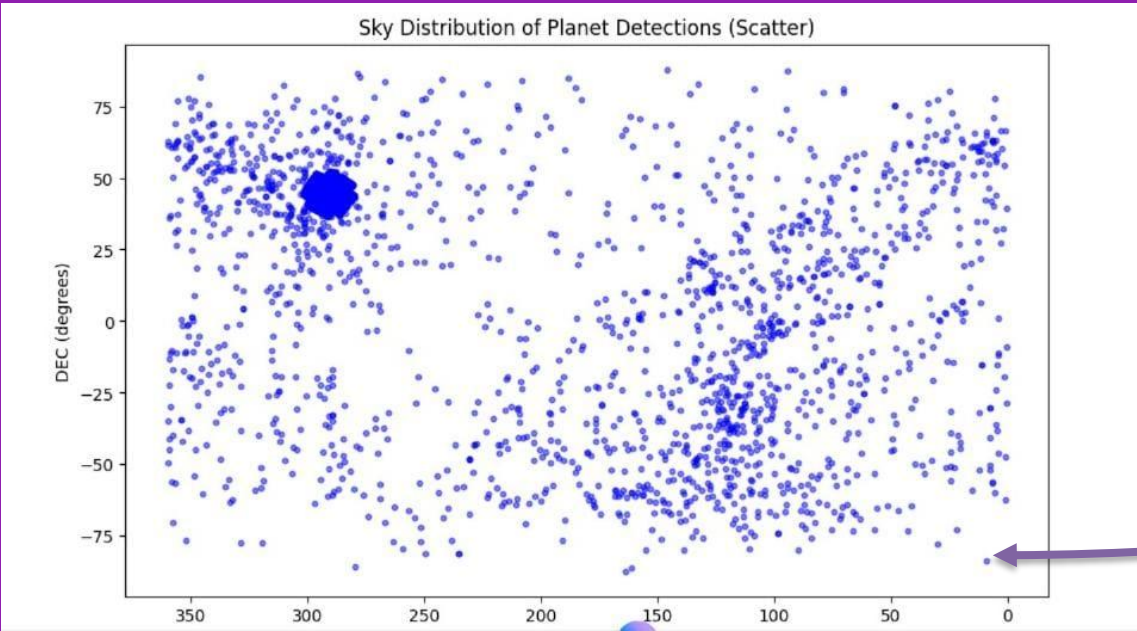
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Train Custom Model **CUSTOM TRAINING**

Upload training data to create your own ML model

Click to upload training data (CSV)
CSV files with labeled exoplanet data

Train Model



INNOVATION & ARCHITECTURE

MODEL

INNOVATIVE MODEL ARCHITECTURE

Hybrid Ensemble Model of Xgboost , lightbgm , randomforest

Custom ensemble model Surpassing Academic Papers in performance

Model tested with cross-validation → Robust and Reliable predictions

Ready for real-world application (researchers, educational use)

KEY FEATURES

Novel architecture combining multiple datasets

Feature engineering inspired by astrophysics principles (stellar properties, transit signals)

Interactive dashboard for exoplanet research

IMPACT & FUTURE SCOPE

FUTURE UPGRADES

Real-time telescope integration

Open API for researchers

Cross-mission training (TESS + JWST)

Improve model accuracy > 95%

IMPACT

Addresses major problem in exoplanet discovery (speed, scale, accuracy)

Enables researchers worldwide to discover, validate, and study new exoplanets

Deep integration of NASA datasets ensures reliability and scientific relevance

CHALLENGES

Large dataset preprocessing

Imbalanced classes (few true exoplanets)

Training compute limits

LEARNING

Efficient model optimization

Handling noisy astronomical data

OUR AI
DOESN'T JUST
FIND PLANETS
– IT FINDS
POSSIBILITIES

THANK YOU