

Introduction:

In this project proposal, I outline the approach to analyze the habitability zones of exoplanets.

Chosen Phenomenon and Data Source:

The chosen phenomenon is the habitability zones around exoplanets. Data will be from the NASA Exoplanet Archive. I will use the data for stellar luminosities, stellar radii, planetary radii, and orbital distances.

Equations for Data Fitting:

- Habitable Zone Model: Utilizing equations based on stellar luminosity and planetary characteristics to define habitable regions.

Data Generation for Testing:

Synthetic data will be generated using Python's NumPy library to simulate diverse exoplanetary systems.

Data Filtering:

- Outlier Removal: I wrote code in VS to exclude rows that didn't have all data points because I needed all data points to interpret the data.
- Quality Flags: Filtering out low-quality observations pointed out by NASA.

Data Fitting with Error:

- Model Selection: Choosing between habitable zone models based on observed exoplanet distributions.

The data for this analysis was sourced from the NASA Exoplanet Archive. The dataset includes parameters such as planet orbital distance (pl_orbsmax), planet radius (pl_rade), stellar radius (st_rad), and stellar luminosity (st_lum). Before analysis, missing values were removed from the dataset using the Pandas library in Python. The habitable zone was defined based on theoretical models considering factors such as stellar luminosity distances to the exoplanets. The scatter plot generated provided insights into the distribution of potentially habitable exoplanets in relation to their host stars.