Lucifer's Screwdriver: A machine learning approach to predicting potentially hazardous asteroids

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Abstract

1 Introduction

2 Data

Orbital and photometric data were obtained from the Minor Planet Center.

3 Simulations

Minimum orbit intersection distances (MOID) were obtained by the standard Fortran package written by Giovanni Gronchi. Objects which satisfy MOID $< 0.05\,\mathrm{AU}$ and $H > 22$ are labeled as potentially hazardous objects (PHO).

4 Predictive Model

We train a deep neural network on the orbital parameters, with their PHO status as labels. The result is a predictive model, which, given orbital parameters and absolute magnitude, can predict an object's PHO status.

5 Results

6 Conclusions