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Observing Dark Worlds

Can you find the Dark Matter that dominates our Universe? Winton Capital offers you the chance to unlock the secrets of dark worlds.

$20,000 · 353 teams · 5 years ago

Competition Data   Edit

⊞ Gridded_Signal_bench...   **Train_Skies.zip**   2.9 MB   ⬇ Download

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Overview	**Data**	Discussion	Leaderboard	Rules

⊞ Training_halos.csv

🗋 DarkWorldsMetric.py

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🗋 Test_Skies.7z

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🗋 Test_Skies.zip

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🗋 Train_Skies.zip

Data Description

Training Data

The training data consists of 300 simulated skies similar to the final panel in Figure 2 of the description page. Each sky contains between 300 and 740 galaxies. Each galaxy will have an x and y position ranging from 0 to 4200 (units are pixels), and a measure of ellipticity: e1 and e2 (see An Introduction to Ellipticity).

Training galaxy data is provided in a series of 300 files, one file for each Sky (e.g, Training_Sky27.csv or Training_Sky123.csv). These files have 4 columns:

- galaxy id
- x-coordinate
- y-coordinate
- e1
- e2

Dark matter halo locations in each sky are provided in the file **Training_halos.csv**. This file contains 10 columns, namely:

- Sky Id
- number of halos (1, 2 or 3)
- reference x-coordinate (used for evalulation metric)
- reference y-coordinate (used for evalulation metric)
- x-coordinate halo 1
- y-coordinate halo 1
- x-coordinate halo 2
- y-coordinate halo 2
- x-coordinate halo 3
- y-coordinate halo 3

In the case of only two or one halo present there will be zeros in the column.

Test Data

The test data is in a similar format to the training data. There are 120 simulated skies (see final panel in Figure 2 of the description). Each sky contains 300 to 740 galaxies. Each galaxy will have an x and y position ranging from 0 to 4200, e1 and e2 values (totalling 4 columns per galaxy in the sky).

In each sky there are either 1, 2 or 3 dark matter halos. The halo counts in each sky are provided in the file **Test_haloCounts.csv**.

The challenge is to predict the center of each dark matter halo in each test sky based on the galaxy information provided.

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