PRIMORDIAL SPACE

Space: The Final Frontier

AIDI2004-01
AI IN ENTERPRISE SYSTEMS
FINAL PROJECT PROPOSAL

GROUP 13
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–Problem statement

For centuries people have been interested in what lies beyond the little blue planet we call home, and finally, we have the technology to start venturing into what lies beyond. But due to the sheer size of the infinitely expanding space and the number of new discoveries being made, we need some way to easily classify objects in space.

Objective

The aim of Primordial Space is to help people learn more about space by using the power of AI. With this application we aim to allow the user to upload a picture of a galaxy and have the AI identify what type of galaxy it is and teach them about that type of galaxy.

Datasets

Galaxy Zoo

The dataset contains labels for galaxies and other relevant data

zooniverse.org/projects/zookeeper/galaxy-zoo/

SDSS Dataset

The dataset contains images of different types of galaxies.

sdss.org/

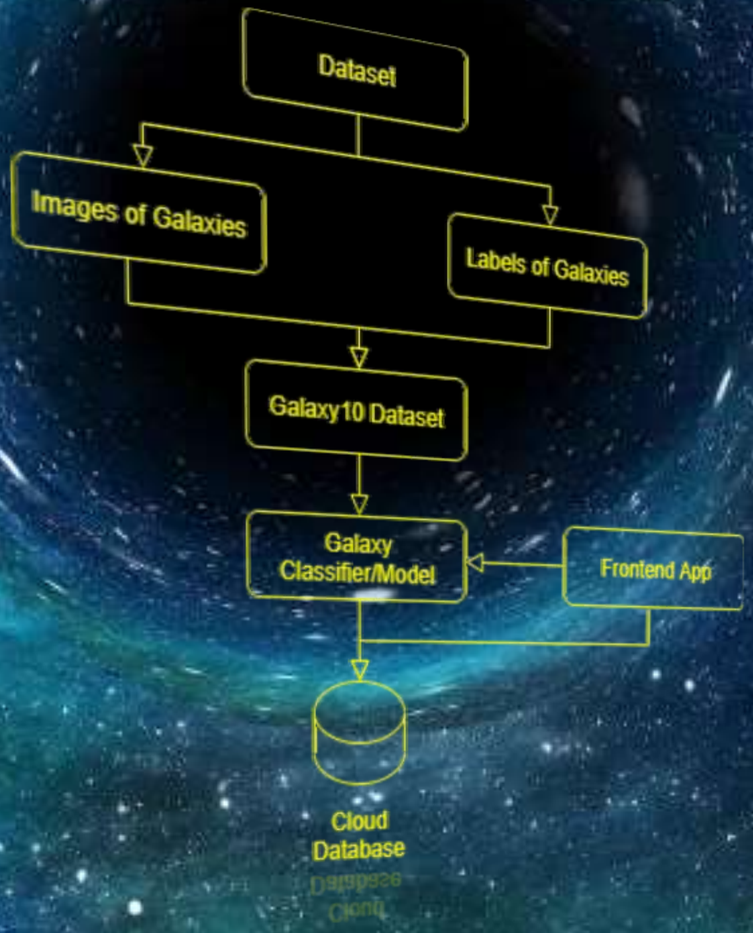
Galaxy10 Dataset

This dataset has taken the labels from the Galaxy Zoo dataset and mapped them to the SDSS dataset.

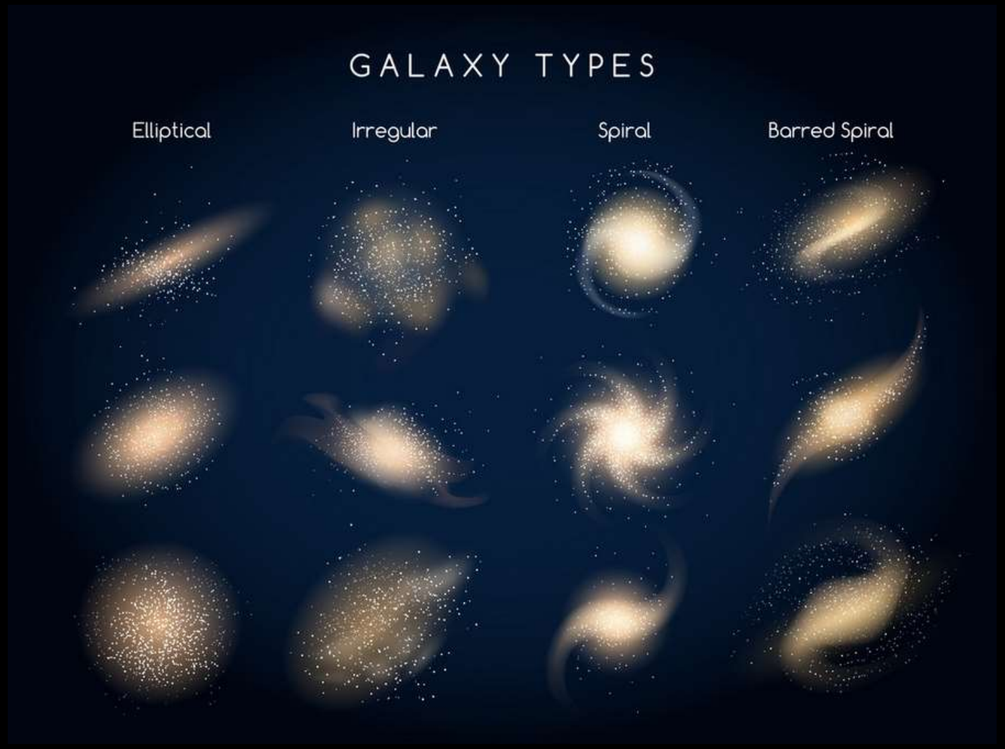
astronn.readthedocs.io/en/latest/galaxy10.html

Approach

The dataset is taken from two sources and then merged to form a dataset with labeled galaxies. Our model will be trained on this merged dataset and made into a Galaxy Classifier. This classifier will be connected to our web app and all the data will be stored in the cloud storage.



User interface



SPIRAL GALAXY

A spiral galaxy is a rotating disk of stars and dust. In the center is a dense bulge of material. Several spiral arms come out from the center. Spiral galaxies have lots of gas and dust and many young stars. The image to the left shows a spiral galaxy from the side. You can see the disk and central bulge.

ELLIPTICAL GALAXIES

Pictured right is a typical elliptical galaxy. As you might have guessed, elliptical galaxies are elliptical, or egg-shaped. The smallest elliptical galaxies are as small as some globular clusters. Giant elliptical galaxies can contain over a trillion stars. Elliptical galaxies are reddish to yellowish in color because they contain mostly old stars.

Time Plan

Objective	~Time To complete task	Completion date
Perform EDA on the Galaxy 10 Dataset	4 hours	March 10th
Data Preprocessing	2.5 hours	March 12th
Train a model to identify the galaxy type	24 hours	March 20th
Create a database to store the results as well as info on galaxies	6 hours	March 22th
Create front end web application to allow the user to interact with the AI and learn more about galaxies	10 hours	March 27th
Create a server using Flask or FastAPI in order to connect the front end with the back end	10 hours	April 1st
Host the website, server and database using cloud computing	3 hours	April 3th

— Thank you