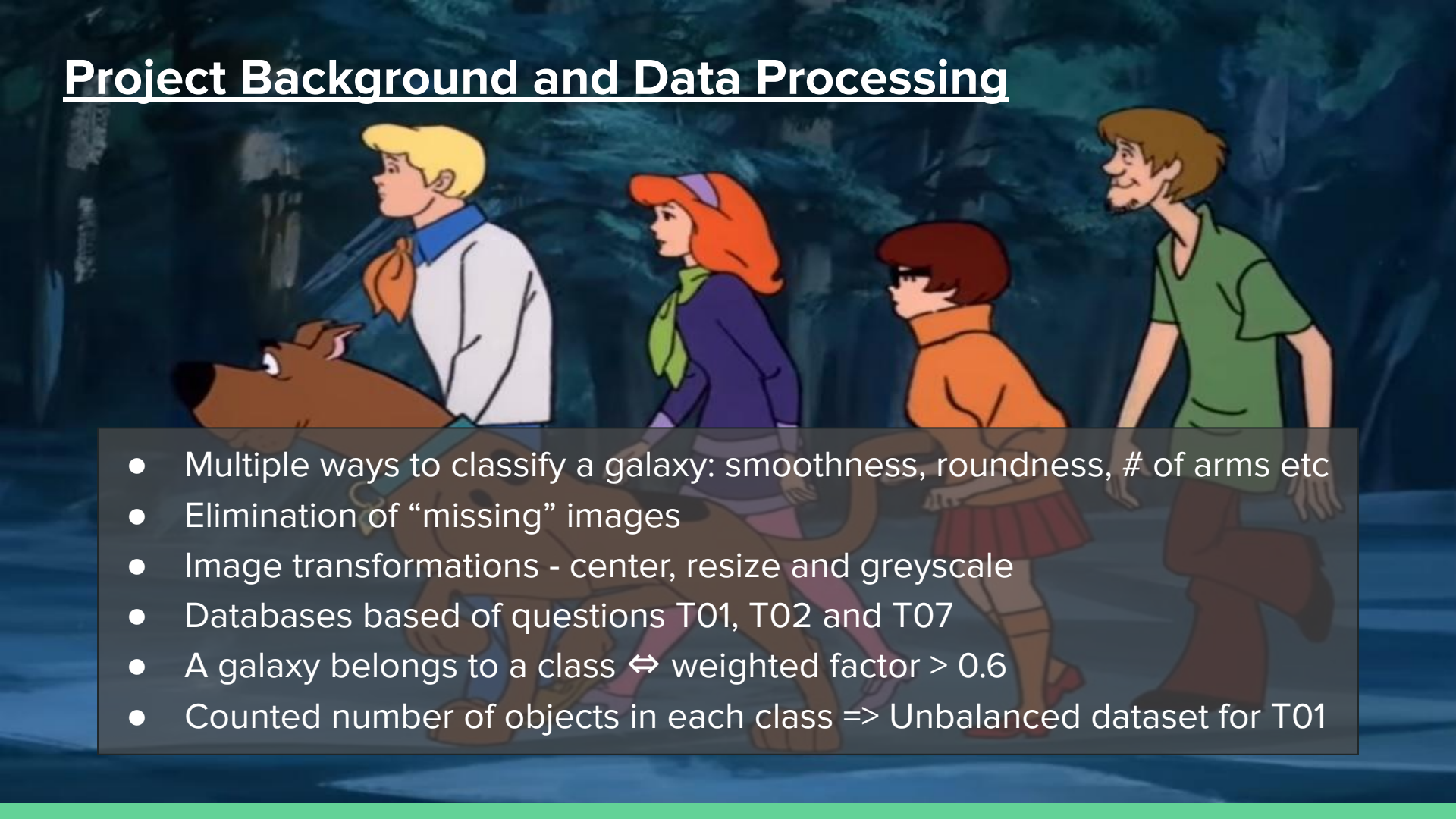
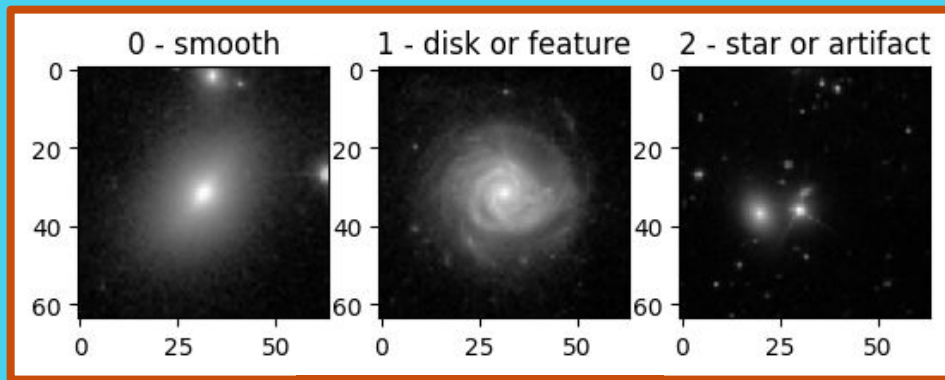




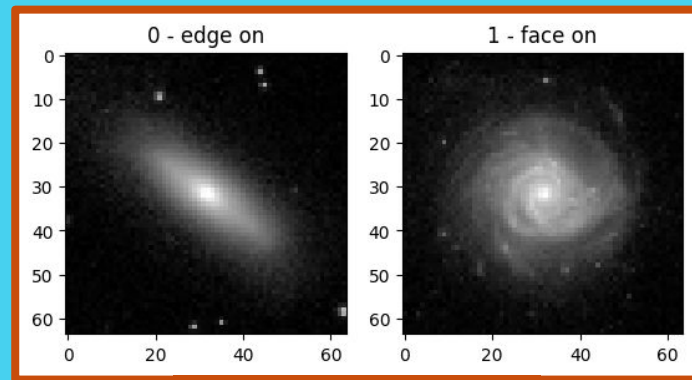
Neural Network Project Presentation -Classification of Galaxies-

Project Background and Data Processing

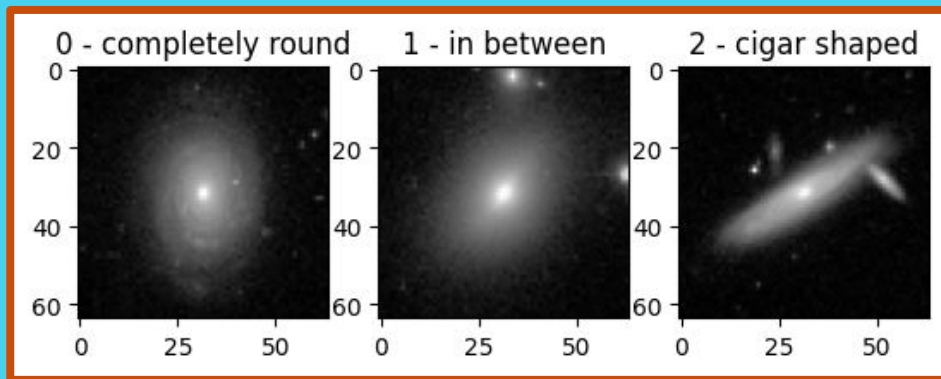
- 
- A cartoon illustration of the Mystery Gang and Scooby-Doo walking through a dark, misty forest. From left to right, they are: Fred Jones (blond hair, white shirt, orange tie), Daphne Blake (orange hair, purple dress, green scarf), Velma Dinkley (brown hair, orange sweater, red skirt), and Shaggy Rogers (brown hair, green shirt, brown pants). Scooby-Doo is walking on the left, looking back over his shoulder. The background is a dark, blue-toned forest with trees and a path.
- Multiple ways to classify a galaxy: smoothness, roundness, # of arms etc
 - Elimination of “missing” images
 - Image transformations - center, resize and greyscale
 - Databases based of questions T01, T02 and T07
 - A galaxy belongs to a class \Leftrightarrow weighted factor > 0.6
 - Counted number of objects in each class \Rightarrow Unbalanced dataset for T01



T01



T02

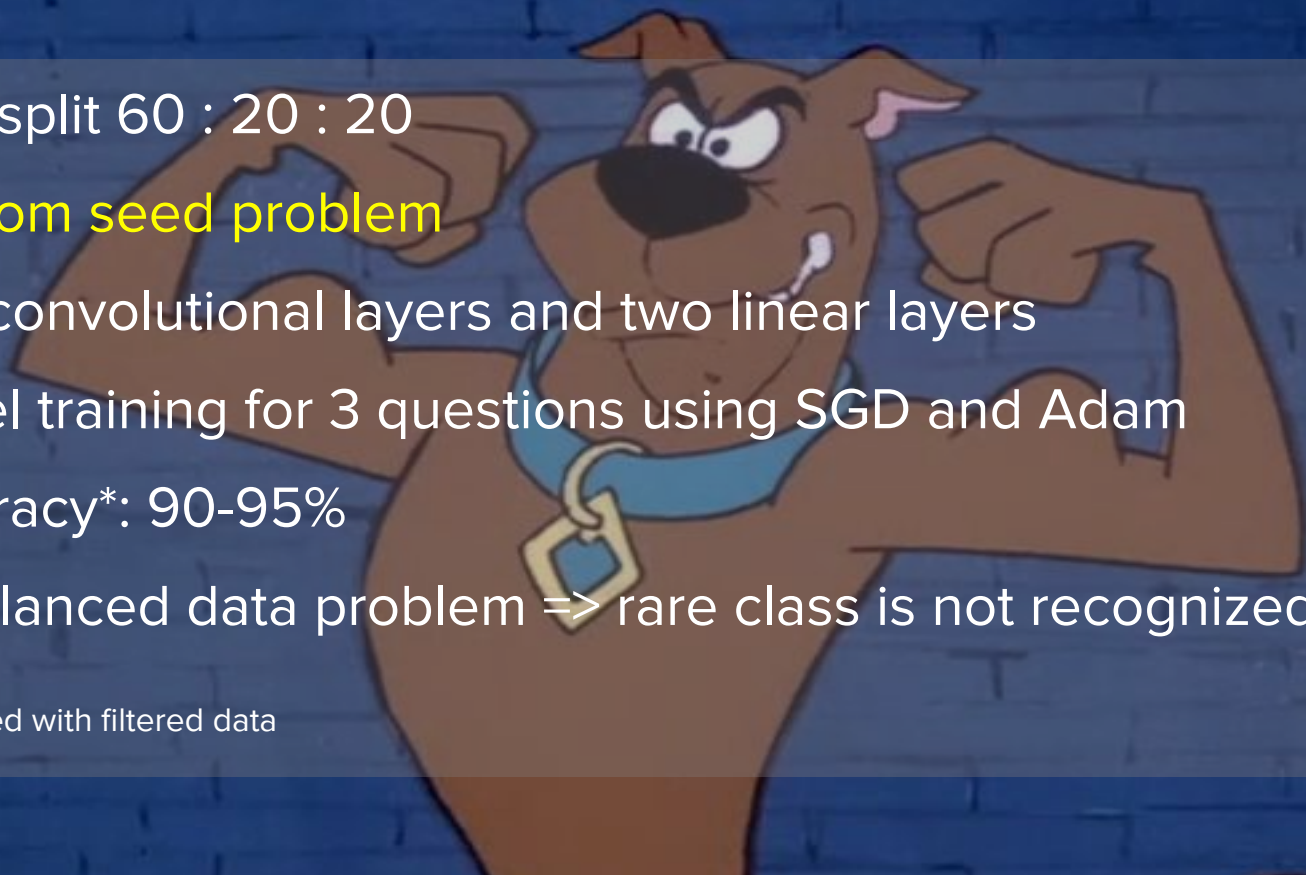


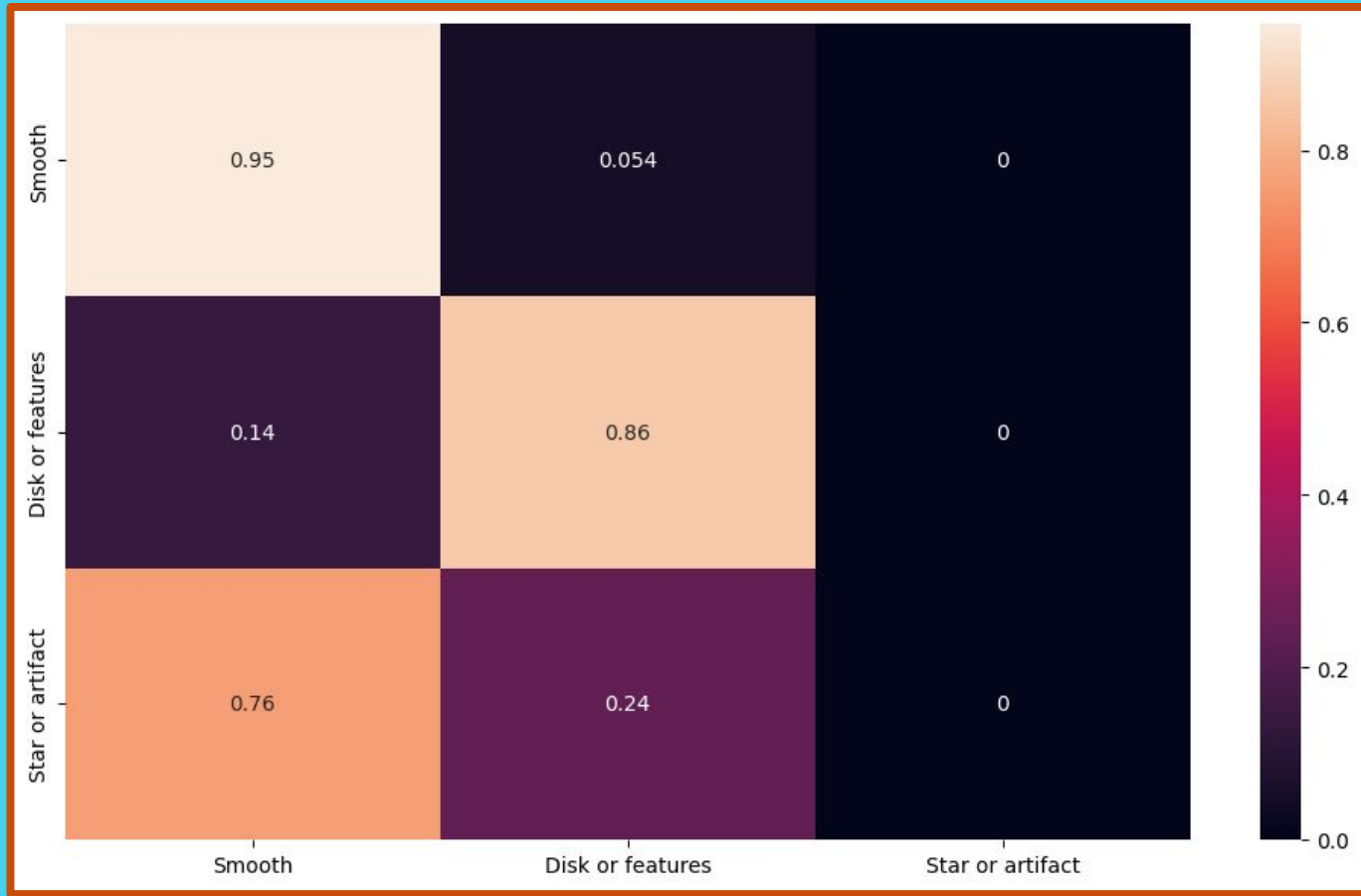
T07

Neural Networks: Challenges and Results

- Data split 60 : 20 : 20
- Random seed problem
- Two convolutional layers and two linear layers
- Model training for 3 questions using SGD and Adam
- Accuracy*: 90-95%
- Unbalanced data problem => rare class is not recognized

*calculated with filtered data





Confusion Matrix for T01 Classification

Improvement and future plans

- Pytorch Lightning and TensorBoard
- Elimination of redundant code
- DocStrings and Documentation

- Custom loss function / Oversampling
- Expand network for complete classification
- Create a GUI or website that can provide the characteristics of an uploaded galaxy picture

A cartoon illustration of the Scooby-Doo gang running. From left to right: Velma in a brown sweater and red skirt, Shaggy in a green shirt and red pants, Scooby-Doo the dog in the center, Fred in a grey shirt and blue pants, and Daphne in a purple dress. They all have expressions of surprise or concern. The background is a solid grey.

Thank you!

Link to the git Repository :
[*https://github.com/SanzianaStelea/mistery_machine_learning*](https://github.com/SanzianaStelea/mistery_machine_learning)