

Challenge

Active Training Course

30.11.2022



2 In a galaxy far far away...

- The (MNIST-like) dataset:
 - Name: "Galaxy10", Ref: <u>https://astronn.readthedocs.io/en/latest/</u> <u>galaxy10sdss.html</u>
 - Minor modifications:
 - First four classes are removed! (\rightarrow Class labels: 0..5)
 - Images are cropped to 64x64 pixels

 Example images of each class from Galaxy10 dataset

 Disk, Face-on, No Spiral
 Smooth, Completely round
 Smooth, in-between round
 Smooth, Cigar shaped
 Disk, Edge-on, Rounded Bulge

 Disk, Edge-on, Boxy Bulge
 Disk, Edge-on, No Bulge
 Disk, Face-on, Tight Spiral
 Disk, Face-on, Medium Spiral
 Disk, Face-on, Loose Spiral

Galaxy10 Dataset: Henry Leung/Jo Bovy 2018, Data Source: SDSS/Galaxy Zoo

4686 colored Images

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- The **task**:
 - Find a galaxy which looks as close as possible to our milky way!
 - Bonus: Generate new galaxies which look as close as possible to our milky way.

3 General Information

- Starting point: <u>https://colab.research.google.com/github/ErUM-Data-Hub/</u> <u>Challenges/blob/main/galaxies.ipynb</u>
- Conditions:
 - You can use your favourite framework (e.g.: PyTorch, TensorFlow, JAX, ...)
 - You can use any architectures you want (e.g.: GNNs, Transformer, VAEs, ...)
- You will work in a team of 5
- Finally, every team presents their solution in a few slides on Thursday (~10min)
 ...who will be the

Teams:

Adversarial Attackers

Team EarlyNeverStopping

The tf.keras.optimizers.Adam's Family

The JAXon 5

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Liberté, Egalité, Fraternité, Dall-É