The Jaxon 5

The Task

Which galaxy image from a ~4600 labeled galaxy image sample best fits the Milky Way image?

The Data

64x 64 pixel Galaxy images from the Galaxy Zoo project. Labeled based on inclination and morphology.

The Problem

There is no “Real” picture of the Milky Way as seen from outside

It is difficult to get the shape of the Milky Way from observations inside the Galaxy, since a lot of dust and stars are in the way.

Only one “model” image exists.

Our Solution: Convolutional VAE

Plug the sample images into the VAE

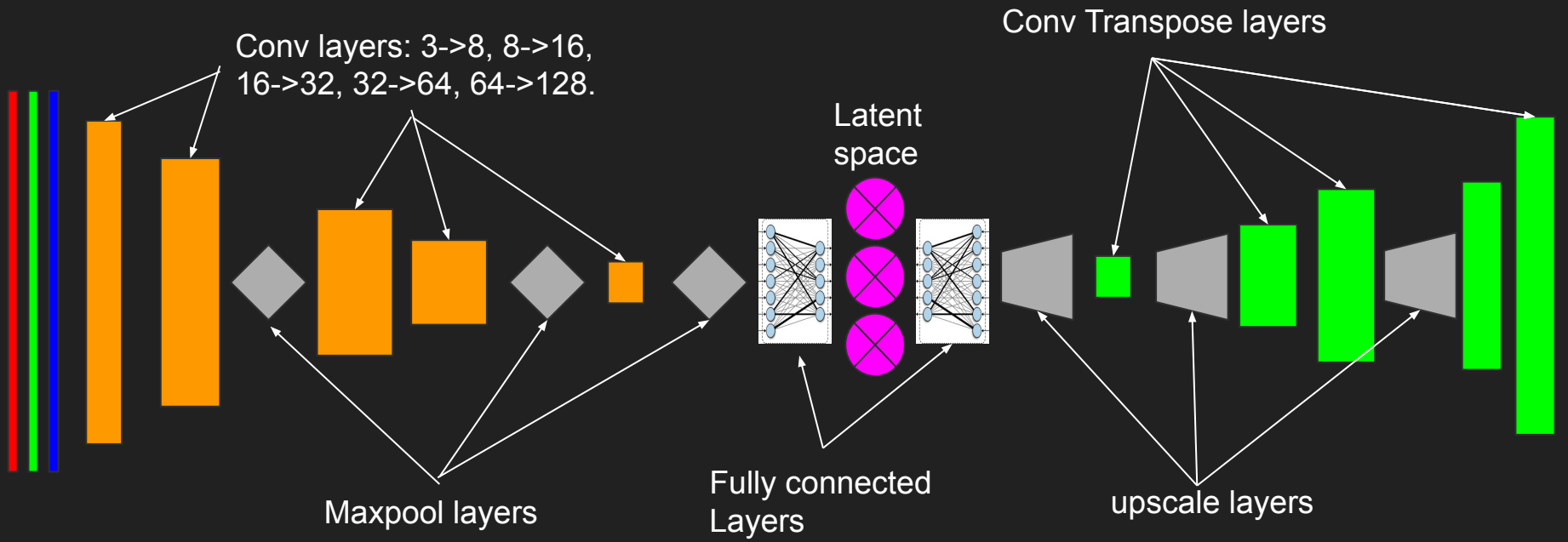
Minimize the reconstruction error

After the model is trained, insert the MW image in the VAE

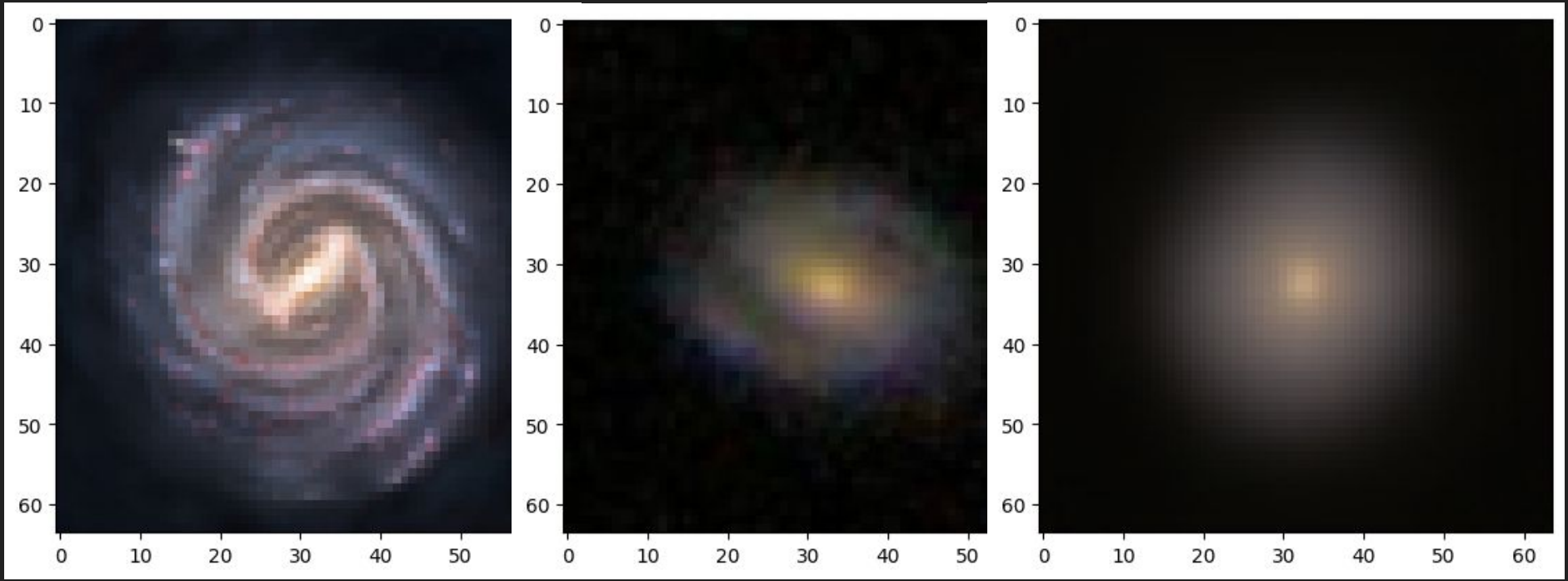
Hopefully, the galaxy(ies) closest to the MW image is latent space are the one(s) most similar to it.

Test set: 10% of the whole set.

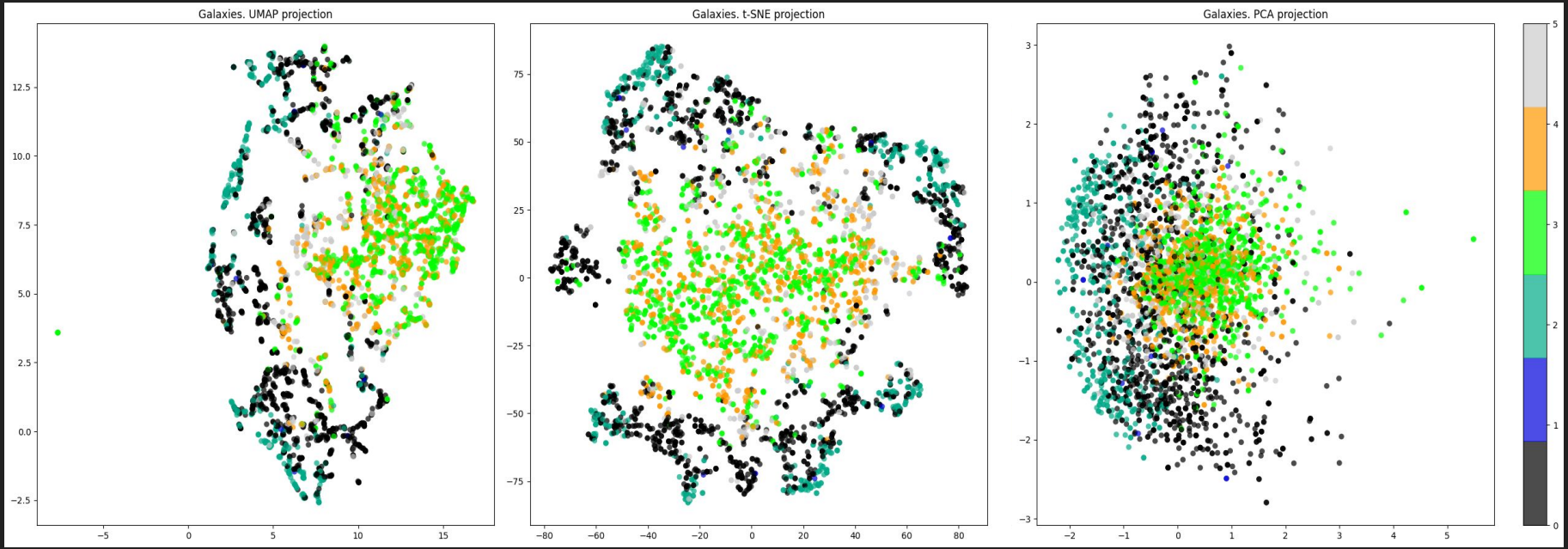
Architecture



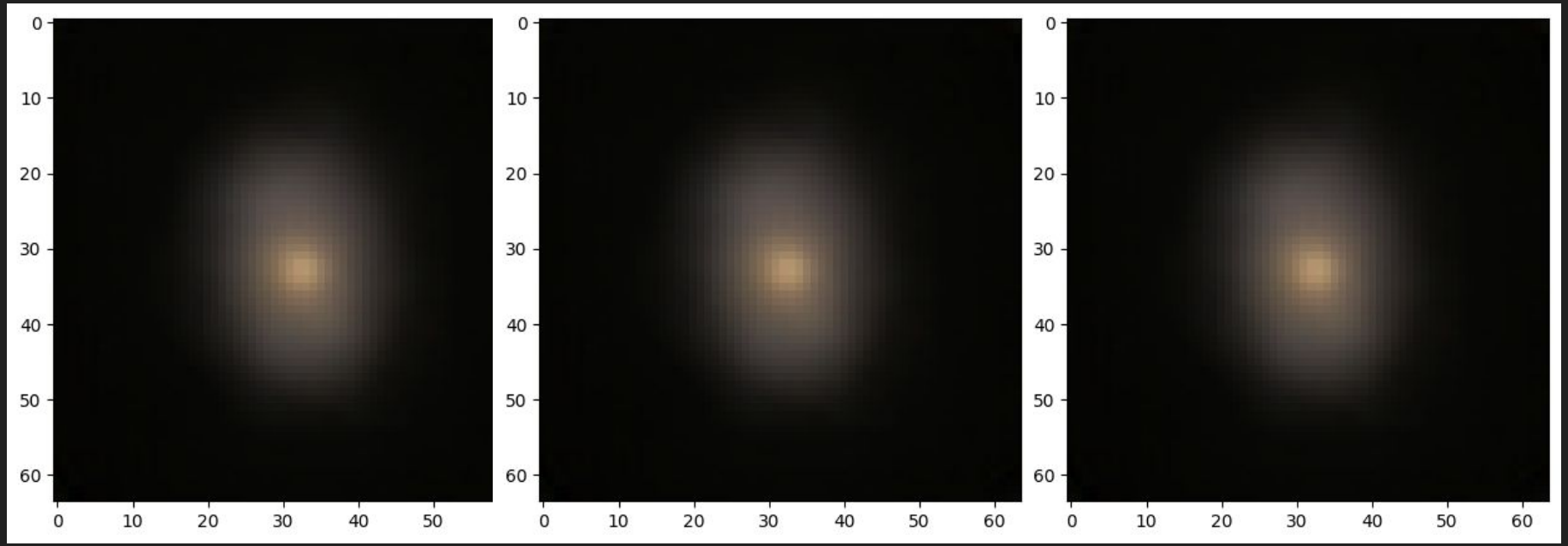
Results: MW image closest



Results:


Galaxies. UMAP projection
Galaxies. t-SNE projection
Galaxies. PCA projection

New samples: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