# ITP 359, Fall 2024

# Homework 3 20 points AUTOENCODER

**Colorize CIFAR10 dataset using an autoencoder.**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **airplane** |  |  |  |  |  |  |  |  |  |  |
| **automobile** |  |  |  |  |  |  |  |  |  |  |
| **bird** |  |  |  |  |  |  |  |  |  |  |
| **cat** |  |  |  |  |  |  |  |  |  |  |
| **deer** |  |  |  |  |  |  |  |  |  |  |
| **dog** |  |  |  |  |  |  |  |  |  |  |
| **frog** |  |  |  |  |  |  |  |  |  |  |
| **horse** |  |  |  |  |  |  |  |  |  |  |
| **ship** |  |  |  |  |  |  |  |  |  |  |
| **truck** |  |  |  |  |  |  |  |  |  |  |

This is a dataset of 50,000 32x32 color training images and 10,000 test images, labeled over 10 categories. See more info at the [CIFAR homepage](https://www.cs.toronto.edu/~kriz/cifar.html).

1. Load CIFAR10 dataset can be directly into you Python program using keras. (1)
2. Assign the train and test datasets (1)
3. Visualize 100 images from the train dataset. (2)
4. Scale the images (if necessary) (1)
5. Convert RGB images to LAB images. (3)
6. Setup the shapes of X and Y (1)
7. Build the autoencoder network (3)
8. Train the model (2)
9. Visualize 10 color images as well as their grayscale images, and their colorized images. (6)