

# Project 1: Image Classification

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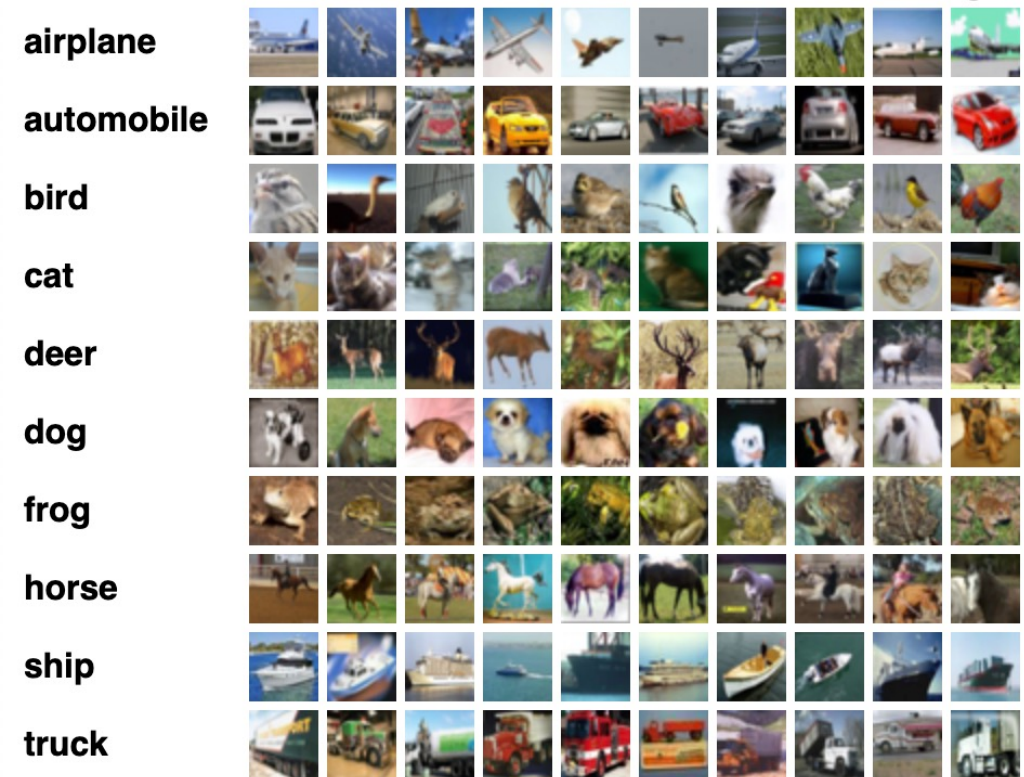
# Overview

- Hello World for Deep Learning!
- Designing and training a network that performs image classification
- The dataset we will be using is CIFAR10
- Hands-on experience in the traditional pipeline of training a neural network:
  - (Data Loader): Applying the necessary transformations/data augmentations
  - (Modeling): Creating a neural network
  - (Training/ Evaluation)

# CIFAR-10 dataset / Data Loader

- The CIFAR-10 dataset consists of 60,000 32x32 color images in 10 classes, with 6000 images per class. There are 50,000 training images and 10,000 test images
- Apply the necessary transformations and suitable data augmentation

Here are the classes in the dataset, as well as 10 random images from each:



['cat', 'horse', 'truck', 'truck']



# Modeling

- Create a network with only fully connected layers
- Create a network with convolutional neural networks and fully connected layers
- Create a ResNet-like network
- Design choices need to be made like:
  - Choosing suitable activation functions
  - Using dropout or not
  - Choosing a suitable optimizer and learning rate
  - Choosing kernel sizes, etc.

# Training/Evaluation

- The training and evaluation (Classification accuracy) methods are already implemented
- Use the cross-entropy loss function
- **Note:** Please be considerate when choosing the suitable number of GPUs (if you use Ibex)
  - For this project, a single GPU (with 4-6 GB) is sufficient

# Resources

- Deep learning Course & Introduction to Pytorch: <https://uvadlc-notebooks.readthedocs.io/en/latest/>
- Python tutorial: <https://cs231n.github.io/python-numpy-tutorial/>



# The Course Webpage



More links to other useful tutorials!