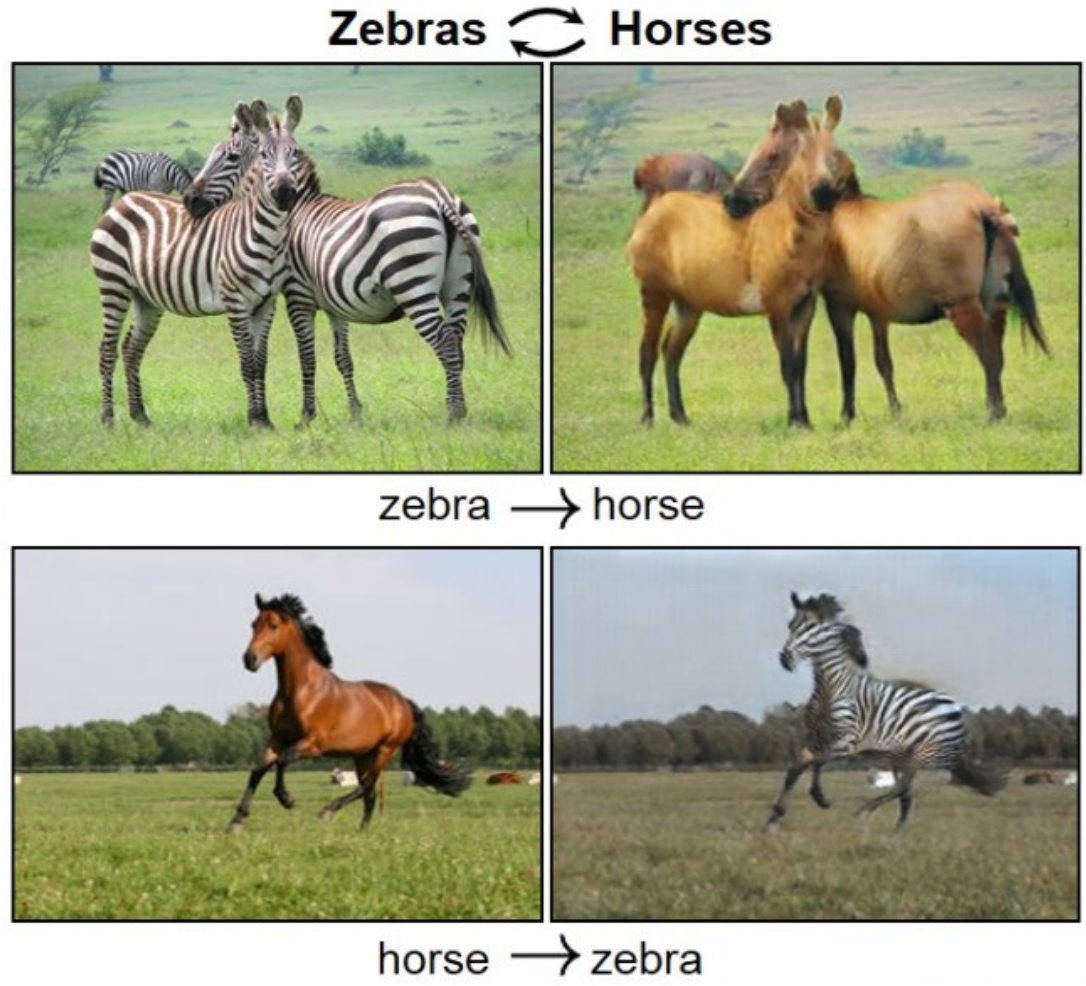
AI 2024, Assignment 3B:

CycleGAN

In this assignment, you will learn how to use CycleGAN to process the Horse2Zebra dataset, focusing on unpaired image-to-image translation tasks, where the goal is to transform images of horses into zebras and vice versa.

Horse2Zebra

https://www.kaggle.com/datasets/balraj98/horse2zebra-dataset



Dataset Overview:

The Horse2Zebra dataset consists of two sets of unpaired images: one containing horse images and the other containing zebra images. CycleGAN is designed to perform image translation between two domains without requiring paired training data.

Task Requirements:

1. Model Design: Implement the CycleGAN architecture using TensorFlow or PyTorch to convert horse images into zebra images and vice versa.
2. Data Preprocessing: Load the Horse2Zebra dataset, perform any necessary image transformations such as resizing or normalization, and prepare the data for model training.
3. Training: Train the CycleGAN model, adjusting hyperparameters such as learning rate, batch size, and epoch count.
4. Evaluation: Evaluate the model's performance using visual inspection and qualitative metrics. Compare how well the generated images resemble the target domain.
5. Visualization: Visualize the results by showing example images of horse-to-zebra and zebra-to-horse translations, along with training curves depicting loss trends.

Deliverables:

1. Code Implementation: Submit the CycleGAN code with appropriate comments.
2. Report: Provide a detailed report including model design, training results, and challenges encountered during image translation.
3. Visualizations: Include relevant charts such as loss curves and examples of generated images for both directions (horse-to-zebra and zebra-to-horse).