Deep Learning for Digital Content Creation Using Autoencoders

This workshop teaches deep learning techniques for designing, training, and deploying neural networks for digital content creation through a series of hands-on exercises. The workshop teaches techniques for transferring the look and feel of an image, as well as autoencoder-based techniques to enhance image quality. By the end of the workshop, you'll be able to create paintings from your photographs, make noise-free images from noisy ones, and convert low-resolution images to high-resolution images.

Duration:	8 hours
Price:	$10,000 for groups of up to 20 (price increase for larger groups). During the workshop, each participant will have dedicated access to a fully configured, GPU-accelerated workstation in the cloud.
Assessment type:	Multiple-choice
Certificate:	Upon successful completion of the workshop, participants will receive an NVIDIA DLI certificate to recognize their subject matter competency and support professional career growth.
Prerequisites:	Basic familiarity with deep learning concepts, such as convolutional neural networks (CNNs); experience programming in Python
Languages:	English
Tools, libraries, and frameworks:	TensorFlow, Torch

Learning Objectives

At the conclusion of the workshop, you'll have an understanding of autoencoders and be able to:

- Explore the architectural innovations and training techniques used to make arbitrary photo and video style transfer
- Detect noise and train your own denoiser for rendered images
- Train a network to create high-resolution images from low-resolution ones

Why Deep Learning Institute Hands-On Training?

- Learn to build deep learning and accelerated computing applications for industries such as autonomous vehicles, finance, game development, healthcare, robotics, and more.
- Obtain hands-on experience with the most widely used, industry-standard software, tools, and frameworks.
- Gain real-world expertise through content designed in collaboration with industry leaders such as the Children's Hospital of Los Angeles, Mayo Clinic, and PwC.
- Earn an NVIDIA DLI certificate to demonstrate your subject matter competency and support career growth.
- Access content anywhere, anytime with a fully configured, GPU-accelerated workstation in the cloud.

Workshop Outline

TOPIC	DESCRIPTION
Introduction (15 mins)	> Meet the instructor. > Create an account at **courses.nvidia.com/join**
Image Style Transfer with Torch (120 mins)	> Transfer the look and feel of one image to another image by extracting distinct visual features. > Qualitatively determine whether a style is transferred correctly using different techniques. > Use architectural innovations and training techniques for arbitrary style transfer.
Break (60 mins)	
Image Super-Resolution Using Autoencoders (120 mins)	> Understand and design an autoencoder. > Train and run a model to produce high-quality images from low-quality ones. > Learn various methods to rigorously measure image quality.
Break (15 mins)	
Rendered Image Denoising Using Autoencoders (120 mins)	> Determine whether noise exists in rendered images. > Use a pre-trained network to denoise sample images or your own images. > Train your own denoiser using the provided dataset.
Final Review (15 mins)	> Review key learnings and wrap up questions. > Complete the assessment to earn a certificate. > Take the workshop survey.