Deep Learning for Digital Content Creation using AutoEncoders

This workshop teaches you to apply deep learning techniques to design , train and deploy neural networks for digital content creation through a series of hands-on exercises. You will work with widely-used deep learning tools, frameworks, and workflows by performing neural network training on a fully-configured GPU accelerated workstation in the cloud. The workshop will teach you the techniques for transferring the look and feel of an image, which will be followed by autoencoder based techniques to enhance quality of an image. The workshop will also teach you methods to detect noise and how to train your own denoiser on some sample images. At the end of the workshop, you will be able to create paintings from your photographs, make noise free images from noisy ones, and take low-resolution images and convert them into high resolution.

Duration	8 hours
Price	$10000 for groups of up to 20 people (includes dedicated access during the course to a fully-configured GPU accelerated workstation in the cloud for each student)
Certification	Upon successful completion of this workshop, you will receive NVIDIA DLI Certification to prove subject matter competency and support professional career growth
Prerequisites	The Workshop assumes a basic familiarity with deep learning concepts such as Convolutional Neural Networks (CNNs) and experience using the python programming language.
Languages	English
Tools, Libraries, and Frameworks	Tensorflow, Torch

Learning Objectives

At the conclusion of the workshop, you will 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.
- Train your own denoiser for rendered images
- Train a network to create high resolution image from low-resolution ones.

Why Deep Learning Institute Hands-on Training?

- Learn how to build deep learning and accelerated computing applications across a wide range of industry segments such as Autonomous Vehicles, Digital Content Creation, Finance, Game Development, and Healthcare
- Obtain guided hands-on experience using the most widely used, industry-standard software, tools, and frameworks
- Attain 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 NVIDIA DLI Certification to prove your subject matter competency and support professional career growth
- Access content anywhere, anytime with a fully configured GPU-accelerated workstation in the cloud

Content Outline

	Components	Description
Introduction (15 mins)	• Getting Started	Instructor Introduction and environment set up
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	Explore the architectural innovations and training techniques used to make arbitrary photo and video 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 measuring image quality	Train your own denoiser for rendered images
Break (15 mins)		
Rendered Image Denoising using Autoencoders (120 mins)	• Determine whether noise exists in rendered images • Use a pre-trained network to denoise some sample images or your own images • Train your own denoiser using the provided dataset	Train a network to create high resolution image from low-resolution ones.
Break (15 mins)		
Assessment (15 mins)	• Answer multiple choice questions covering all three labs.	Test your understanding of the material and identify any gaps in knowledge.