# NVIDIA DLI HANDS-ON TRAINING CATALOG



To get started with DLI hands-on training, visit www.nvidia.com/dli

# INTRODUCTION

The NVIDIA Deep Learning Institute (DLI) trains developers, data scientists, and researchers on how to use deep learning and accelerated computing to solve real-world problems across a wide range of domains.

With access to GPU-accelerated workstations in the cloud, you'll learn how to train, optimize, and deploy neural networks using the latest deep learning tools, frameworks, and SDKs. You'll also learn how to assess, parallelize, optimize, and deploy GPU-accelerated computing applications.

DLI offers training in two formats:

#### **INSTRUCTOR-LED WORKSHOPS**

DLI workshops teach you how to implement and deploy an end-to-end project in one day. Offered via a virtual classroom at customer sites, conferences, and universities, full-day workshops include hands-on training and lectures delivered by DLI-certified instructors. Workshops offer a certificate of competency upon completion of the built-in assessment.

#### ONLINE COURSES

Online, self-paced courses show you how to set up an end-to-end project in eight hours or how to apply a specific technology or development technique in two hours. Online courses can be taken anytime, anywhere—as long as you have a laptop and internet connection. Most eight-hour courses offer a certificate of competency upon completion of the built-in assessment.



#### CERTIFICATE

Participants can earn a certificate to prove subject matter competency and support professional career growth. Certificates are offered for select instructor-led workshops and online courses.

# INSTRUCTOR-LED WORKSHOPS

# DEED I FARNING FUNDAMENTALS

#### Fundamentals of Deep Learning for Computer Vision 🕍



Explore the fundamentals of deep learning by training neural networks and using results to improve performance and capabilities.

PREREQUISITES: Familiarity with basic programming fundamentals, such as functions and variables

TOOLS AND FRAMEWORKS: Caffe, DIGITS

LANGUAGES: English, Japanese, Korean, Simplified Chinese, Traditional Chinese

## Fundamentals of Deep Learning for Multiple Data Types 🙎



Learn how to train convolutional neural networks (CNNs) and recurrent neural networks (RNNs) to generate captions from images and video using TensorFlow and the Microsoft Common Objects in Context (COCO) data set.

PREREQUISITES: Familiarity with basic Python (functions and variables) and prior experience training neural networks

TOOLS AND FRAMEWORKS: TensorFlow

LANGUAGES: English, Japanese, Korean, Traditional Chinese

# Fundamentals of Deep Learning for Natural Language Processing 🙀



Explore how to convert text to machine-understandable representation and train machine translators from one language to another using natural language processing (NLP).

PREREQUISITES: Basic experience with neural networks, Python, and linguistics

TOOLS AND FRAMEWORKS: TensorFlow. Keras LANGUAGES: English

# Fundamentals of Deep Learning for Multi-GPUs 🙎



Find out how to use multiple GPUs to train neural networks and effectively parallelize training of deep neural networks using TensorFlow.

**PREREQUISITES:** Experience with stochastic-gradient-descent mechanics, network architecture. and parallel computing

TOOLS AND FRAMEWORKS: TensorFlow

LANGUAGES: English

# DEEP LEARNING BY INDUSTRY

## Deep Learning for Autonomous Vehicles—Perception 🙎



Learn how to design, train, and deploy deep neural networks and optimize perception components for autonomous vehicles using the NVIDIA DRIVE™ development platform.

PREREQUISITES: Experience with CNNs and C++

TOOLS AND FRAMEWORKS: TensorFlow, NVIDIA TensorRT™, Python, NVIDIA CUDA® C++, DIGITS

LANGUAGES: English, Simplified Chinese

## Deep Learning for Digital Content Creation with Autoencoders 🙎



Discover how to animate characters with phase-function neural networks, explore techniques to make arbitrary photo and video style transfer, and train your own denoiser for rendered images.

PREREQUISITES: Basic familiarity with deep learning concepts, such as CNNs and experience with Python

TOOLS AND FRAMEWORKS: TensorFlow, Torch

LANGUAGES: English

# Deep Learning for Healthcare Image Analysis 🙎



Learn how to apply CNNs to MRI scans to perform a variety of medical tasks and calculations.

PREREQUISITES: Basic familiarity with deep neural networks and basic coding experience in Python or similar language

TOOLS AND FRAMEWORKS: R, MXNet, TensorFlow, Caffe, DIGITS

LANGUAGES: English

## Deep Learning for Industrial Inspection 🙎



Find out how to design, train, test, and deploy building blocks of a hardware-accelerated industrial inspection pipeline.

PREREQUISITES: Familiarity with deep neural networks, and experience with Python and deep learning frameworks, such as TensorFlow, Keras, and PyTorch

TOOLS AND FRAMEWORKS: TensorFlow, TensorRT, Keras

LANGUAGES: English, Traditional Chinese

# Deep Learning for Intelligent Video Analytics 🙎



Explore how to deploy object detection and tracking networks to evaluate real-time, large-scale video streams.

PREREQUISITES: Experience with deep networks (specifically variations of CNNs) and intermediatelevel experience with C++ and Python

TOOLS AND FRAMEWORKS: DeepStream 3.0, TensorFlow LANGUAGES: English, Korean

#### Deep Learning for Robotics 🙎



Explore how to create robotic solutions on an NVIDIA Jetson™ for embedded applications.

PREREQUISITES: Basic familiarity with deep neural networks and basic coding experience in Python or similar language

TOOLS AND FRAMEWORKS: ROS, DIGITS, NVIDIA Jetson LANGUAGES: English

# Applications of Al for Anomaly Detection 🙎



Learn to detect anomalies in large data sets to identify network intrusions using supervised and unsupervised machine learning techniques, such as accelerated XGBoost, autoencoders, and generative adversarial networks (GANs).

PREREQUISITES: Experience with CNNs and Python

TOOLS AND FRAMEWORKS: RAPIDS, Keras, GANs, LANGUAGES: English

XGBoost

# Applications of Al for Predictive Maintenance 🎑



Discover how to identify anomalies and failures in time-series data, estimate the remaining useful life of the corresponding parts, and use this information to map anomalies to failure conditions.

PREREQUISITES: Experience with Python and deep networks

TOOLS AND FRAMEWORKS: TensorFlow, Keras LANGUAGES: English

# ACCELERATED COMPUTING FUNDAMENTALS

## Fundamentals of Accelerated Computing with CUDA C/C++ 🙀



Learn how to accelerate and optimize existing C/C++ CPU-only applications to leverage the power of GPUs using the most essential CUDA techniques and the Nsight Systems profiler.

PREREQUISITES: Basic C/C++ competency, including familiarity with variable types, loops, conditional statements, functions, and array manipulations. No previous knowledge of CUDA programming is assumed.

LANGUAGES: English, Korean, Traditional Chinese

#### Fundamentals of Accelerated Computing with CUDA Python 🙎



Explore how to use Numba—the just-in-time, type-specializing Python function compiler—to accelerate Python programs to run on massively parallel NVIDIA GPUs.

PREREQUISITES: Basic Python competency, including familiarity with variable types, loops, conditional statements, functions, and array manipulations. Also, must have NumPy competancy, including the use of ndarrays and ufuncs

LANGUAGES: English

# ACCELERATED DATA SCIENCE FUNDAMENTALS

#### Fundamentals of Accelerated Data Science with RAPIDS



Learn how to perform multiple analysis tasks on large data sets using RAPIDS, a collection of data science libraries that allows end-to-end GPU acceleration for data science workflows.

PREREQUISITES: Professional data science experience with Python, including proficiency in pandas and NumPy. Also, must have familiarity with common machine learning algorithms, including XGBoost, linear regression, DBSCAN, K-Means, and SSSP

LANGUAGES: English

# **ONLINE COURSES**

# DEEP I FARNING FUNDAMENTALS

#### Fundamentals of Deep Learning for Computer Vision 🕍



Explore the fundamentals of deep learning by training neural networks and using results to improve performance and capabilities.

**PREREQUISITES:** Familiarity with basic programming fundamentals, such as functions and variables

TOOLS AND FRAMEWORKS: Caffe, DIGITS

**DURATION:** 8 hours

LANGUAGES: English, Japanese, Korean, Simplified Chinese. Traditional Chinese

PRICE: \$90 (excludes tax. if applicable)

#### Getting Started with Deep Learning on Jetson Nano 🕍



Discover how to build a deep learning classification project with computer vision models using the NVIDIA Jetson Nano™ Developer Kit.

PREREQUISITES: Basic familiarity with Python (helpful, not required)

TOOLS AND FRAMEWORKS: PyTorch, Jetson Nano LANGUAGES: English

**DURATION: 8 hours** PRICE: Free (hardware required)

#### Optimization and Deployment of TensorFlow Models with TensorRT

Learn how to optimize TensorFlow models to generate fast inference engines in the deployment stage.

PREREQUISITES: Experience with TensorFlow and Python

TOOLS AND FRAMEWORKS: TensorFlow, Python,

TensorRT (TF-TRT)

LANGUAGES: English

**DURATION: 2 hours** PRICE: \$30 (excludes tax, if applicable)

#### Deep Learning at Scale with Horovod

Find out how to scale deep learning training to multiple GPUs with Horovod, the opensource distributed training framework originally built by Uber.

PREREQUISITES: Competency in Python and professional experience training deep learning models in Python

TOOLS AND FRAMEWORKS: Horovod, TensorFlow 2, Keras LANGUAGES: English

**DURATION: 2 hours PRICE:** \$30 (excludes tax, if applicable)

#### Modeling Time-Series Data with Recurrent Neural Networks in Keras

Explore how to classify and forecast time-series data using RNNs, such as modeling a patient's health over time.

PREREQUISITES: Basic experience with deep learning

TOOLS AND FRAMEWORKS: Keras LANGUAGES: English

**DURATION:** 2 hours **PRICE:** \$30 (excludes tax, if applicable)

# **DEEP LEARNING BY INDUSTRY**

#### **GAME DEVELOPMENT AND DIGITAL CONTENT**

#### Image Style Transfer with Torch

Discover how to transfer the look and feel of one image to another by extracting distinct visual features using CNNs.

PREREQUISITES: Experience with CNNs

TOOLS AND FRAMEWORKS: Torch LANGUAGES: English

**DURATION:** 2 hours **PRICE:** \$30 (excludes tax, if applicable)

#### Image Super Resolution Using Autoencoders

Leverage the power of a neural network with autoencoders to create high-quality images from low-quality source images.

PREREQUISITES: Experience with CNNs

LANGUAGES: English,
Simplified Chinese

TOOLS AND FRAMEWORKS: Keras

**DURATION:** 2 hours **PRICE:** \$30 (excludes tax, if applicable)

#### **HEALTHCARE**

#### Medical Image Classification Using the MedNIST Dataset

Explore an introduction to deep learning for radiology and medical imaging by applying CNNs to classify images in a medical imaging data set.

PREREQUISITES: Basic experience in Python LANGUAGES: English,

TOOLS AND FRAMEWORKS: PyTorch

**DURATION:** 2 hours **PRICE:** \$30 (excludes tax, if applicable)

# Image Classification with TensorFlow: Radiomics—1p19q Chromosome Status Classification

Learn how to train CNNs to detect radiomics from MRI imaging.

PREREQUISITES: Basic experience with CNNs and Python
LANGUAGES: English,
Simplified Chinese

TOOLS AND FRAMEWORKS: TensorFlow

**DURATION:** 2 hours **PRICE:** \$30 (excludes tax, if applicable)

#### Data Augmentation and Segmentation with Generative Networks for Medical Imaging

Discover how to use GANs for medical imaging by applying them to the creation and segmentation of brain MRIs.

PREREQUISITES: Experience with CNNs

TOOLS AND FRAMEWORKS: TensorFlow LANGUAGES: English

**DURATION: 2 hours** PRICE: \$30 (excludes tax, if applicable)

#### Coarse-to-Fine Contextual Memory for Medical Imaging

Find out how to use coarse-to-fine context memory (CFCM) to improve traditional architectures for medical image segmentation and classification tasks.

PREREQUISITES: Experience with CNNs and long short-term memory (LSTM)

TOOLS AND FRAMEWORKS: TensorFlow LANGUAGES: English

**DURATION: 2 hours** PRICE: \$30 (excludes tax, if applicable)

#### INTELLIGENT VIDEO ANALYTICS

#### Al Workflows for Intelligent Video Analytics with DeepStream

Learn how to build hardware-accelerated applications for intelligent video analytics (IVA) with DeepStream and deploy them at scale to transform video streams into insights.

PREREQUISITES: Experience with C++ and GStreamer

TOOLS AND FRAMEWORKS: DeepStream 3.0 LANGUAGES: English

**DURATION: 2 hours PRICE:** \$30 (excludes tax, if applicable)

#### Getting Started with DeepStream for Video Analytics on Jetson Nano 🙎



Explore how to build DeepStream applications to annotate video streams using object detection and classification networks.

PREREQUISITES: Basic familiarity with C LANGUAGES: English

TOOLS AND FRAMEWORKS: DeepStream, TensorRT, Jetson Nano

DURATION: 8 hours; Self-paced PRICE: Free

# ACCELERATED COMPUTING FUNDAMENTALS

# Fundamentals of Accelerated Computing with CUDA C/C++ 🙎



Discover how to accelerate and optimize existing C/C++ CPU-only applications to leverage the power of GPUs using the most essential CUDA techniques and the Nsight Systems profiler.

PREREQUISITES: Basic C/C++ competency, including familiarity with variable types, loops, conditional statements, functions, and array manipulations. No previous knowledge of CUDA programming is assumed.

LANGUAGES: English, Japanese, Korean, Simplified Chinese, Traditional Chinese

PRICE: \$90 (excludes tax, if applicable)

**DURATION: 8 hours** 

## Fundamentals of Accelerated Computing with CUDA Python 🕍



Explore how to use Numba—the just-in-time, type-specializing Python function compiler—to create and launch CUDA kernels to accelerate Python programs on massively parallel NVIDIA GPUs.

PREREQUISITES: Basic Python competency, including familiarity with variable types, loops, conditional statements, functions, and array manipulations. Also, must have NumPy competency, including the use of ndarrays and ufuncs

LANGUAGES: English

PRICE: \$90 (excludes tax. if applicable)

**DURATION: 8 hours** 

#### Fundamentals of Accelerated Computing with OpenACC

Find out how to build and optimize accelerated heterogeneous applications on multiple GPU clusters using a combination of OpenACC, CUDA-aware MPI, and NVIDIA profiling tools.

PREREQUISITES: Basic experience with C/C++ LANGUAGES: English

**DURATION: 8 hours** PRICE: \$90 (excludes tax, if applicable)

## High-Performance Computing with Containers

Learn how to reduce complexity and improve portability and efficiency of your code by using a containerized environment for high-performance computing (HPC) application development.

PREREQUISITES: Proficiency programming in C/C++ and professional experience working on **HPC** applications

TOOLS AND FRAMEWORKS: Docker, Singularity, HPC Container Maker (HPCCM)

LANGUAGES: English

**DURATION: 2 hours** 

PRICE: \$30 (excludes tax. if applicable)

## OpenACC-2X in 4 Steps

Discover how to accelerate C/C++ or Fortran applications using OpenACC to harness the massively parallel power of NVIDIA GPUs.

PREREQUISITES: Basic experience with C/C++ LANGUAGES: English

**DURATION: 2 hours** PRICE: \$30 (excludes tax, if applicable)

# ACCELERATED DATA SCIENCE FUNDAMENTALS

#### Fundamentals of Accelerated Data Science with RAPIDS 🔯



Find out how to perform multiple analysis tasks on large data sets using RAPIDS, a collection of data science libraries that allows end-to-end GPU acceleration for data science workflows.

PREREQUISITES: Professional data science experience with Python, including proficiency in pandas and NumPy. Also, must have familiarity with common machine learning algorithms, including XGBoost, linear regression, DBSCAN, K-Means, and SSSP

LANGUAGES: English PRICE: \$90 (excludes tax, if applicable)

**DURATION: 8 hours** 

#### Accelerating Data Science Workflows with RAPIDS

Learn to build a GPU-accelerated, end-to-end data science workflow using RAPIDS open-source libraries for massive performance gains.

PREREQUISITES: Advanced competency in pandas, NumPy, and scikit-learn

LANGUAGES: English PRICE: \$30 (excludes tax, if applicable)

**DURATION:** 2 hours

# GPU COMPUTING IN THE DATA CENTER

#### Introduction to AI in the Data Center

Explore AI, GPU computing, NVIDIA AI software architecture, and how to implement and scale AI workloads in the enterprise data center.

PREREQUISITES: Basic knowledge of enterprise networking, storage, and data center operations

LANGUAGES: English PRICE: \$30 (excludes tax, if applicable)

**DURATION:** 4 hours

For full workshop details or to enroll in online training, visit www.nvidia.com/dli



